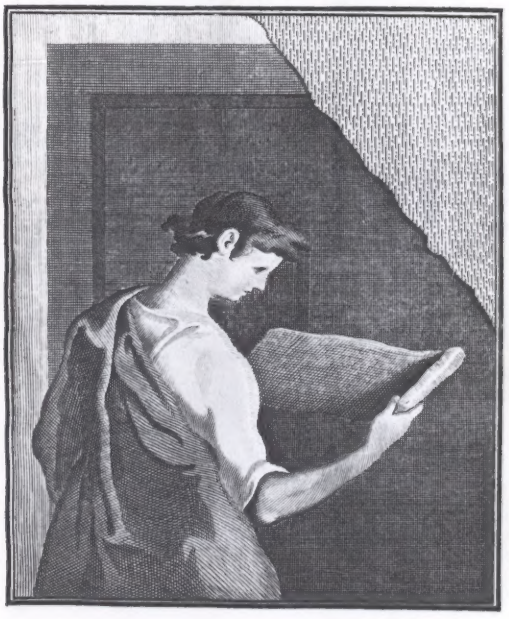


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Royal Institute of British Architects.

INCORPORATED IN THE SEVENTH YEAR OF WILLIAM IV.

TRANSACTIONS: VOL. III. NEW SERIES.

FIFTY-THIRD YEAR OF FOUNDATION.

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Royal Institute of British Architects.

INCORPORATED IN THE SEVENTH YEAR OF WILLIAM IV.

THE SESSION 1886-87.

MR. EDWARD I'ANSON, who was elected to the Presidential Chair in May 1886, opened the new Session on the first Monday of November following, with an Address,[1] in which he referred to the absorbing work of the previous Session, namely, the preparation of a draft Charter, as a supplement to that granted by KING WILLIAM THE FOURTH in 1837, and for the grant of which the Royal Institute had petitioned HER MAJESTY THE QUEEN in Council. The draft includes an enlargement of functions and a series of progressive developments necessitated by the ever-changing conditions of existence, which, if granted and duly carried out, will, in the PRESIDENT'S opinion, conduce to the lasting and best interests, not only of the Body Corporate, but also of the profession of British Architects, for, in all that is done, or hoped to be done, it should be remembered that the two—the Royal Institute and the profession—are more than allied; they are one and the same force, inseparable, and indistinguishable one from the other.

The PRESIDENT characterised as a happy proposal the recent organisation of four Departmental Committees for Art, Literature, Practice, and Science, appointed by the general Body, each possessing its own honorary officers, and its powers of departmental action; and he extolled the wisdom shown in ordaining that such Committees shall report to the Council of

[1] The Address, in its entirety, is printed in the *Journal of* PROCEEDINGS, Vol. III., 2, pp. 17-25.

the Royal Institute only, and that no public action shall be taken by any of them except through the Council. Another step, which he thought might be attended with more possibilities of accident than the former—a step towards the professional federation of architects,—had also been taken, and the PRESIDENT was of opinion that in the discussion of the matter certain principles existed which might be taken as a basis, not the least being the desirability of maintaining uniformity of action, the necessity of examinations, and a constant interchange of communications.

The PRESIDENT alluded to the visit to England of Monsieur CHARLES GARNIER, President of the Académie des Beaux-Arts (Institut de France), for the purpose of receiving the Royal Gold Medal, and he described the ceremony he had witnessed of the last Annual Distribution of Prizes at the École des Beaux-Arts, Paris.

The obituary of the past Session followed, and a notice of the late Mr. RICHARDSON'S short but brilliant career led the PRESIDENT to signalise the rise within the United States of a school of much artistic power, which bids fair in due season to attain position and ultimate eminence in the architectural records of the Old and New World, and looking back, as he can do, over half a century of practice, he laid some stress on this advent of American kinsmen to a place in the great Republic of Arts. He hoped that they had prepared for it a solid and substantial foundation of Science, without which no architecture, however beautiful in appearance, can ever flourish or reach perfection. The PRESIDENT declared himself an advocate for the systematic teaching of art, as far as it can be taught, and of all those sciences pertaining to the theory and practice of building construction; and he maintained that any attempt to teach, in order to be successful, must be tested by constant examination.

The Royal Institute agreed some ten years ago to make the successful passing of an Examination a condition precedent to admission after 1882 as a candidate for the Associateship, and the PRESIDENT felt that it is an absolute obligation on the senior members to personally bring the matter to the notice of those in their employ, whether as assistants or pupils.

After a reference to the Report which is awaited from a Special Committee, appointed by the Council to consider, in conjunction with three representatives of the Architectural Association, questions of Education, and after an allusion of high commendation to the excellent work done by the junior Body, the PRESIDENT expressed a hope that the powers

humbly asked for in the Petition recently presented to THE QUEEN in Council would enable the Royal Institute to render to the Architectural Association substantial aid in support of its educational work. "And while "preparing," said Mr. I'ANSON, "to lend a hand to a junior Body, working "for objects identified with our own, may we not hope that a higher "educational Institution, far older, infinitely richer than we are, and "invested with extraordinary powers, which it derives direct from the "Sovereign, may in like manner hold out a hand to us? Although there "exists nothing in this country resembling the Paris École des Beaux-Arts, "which is maintained at great cost by the State, there is the Royal "Academy of Arts, which, by prudent management, under three Kings and "one Queen of England, has become possessed of very ample means. May "we not naturally look to this favoured Institution, and hope that the "Royal Academy will see its way, not only to carry out the provisions "relating to Architecture as laid down at its foundation, but also to develop "the educational powers with which it has been specially intrusted?" The PRESIDENT concluded this part of his Address with an expression of regret that the careful recommendations of the Royal Commission of 1863, which were intended to improve the representation and position of Architecture at the Royal Academy, had been totally disregarded.

The PRESIDENT continued with reflections upon the many changes that had come over the spirit of the time within his own memory. The strong feelings to which utterance was given after AUGUSTUS WELBY PUGIN published his "*Contrasts*" had died out. He had once heard one of the most distinguished English architects (now deceased) of the century express an opinion that St. Paul's Cathedral was only fit to be converted into a Railway Station; yet quite lately some of the details of Sir CHRISTOPHER WREN'S masterpiece had been illustrated in the *Sketch-Book* of the Architectural Association. Italy, too, had recently been visited by a large number of English students—the PRESIDENT was sure that they did not find her cities wanting in those qualities of picturesque effect which they are taught very properly to admire,—and he had every expectation that the gloom and monastic severity, the labyrinth-like arrangements of stair and corridor, of which the people who pay for our public and municipal buildings complain as characteristic of too many recent interiors, will disappear.

9, *Conduit Street, Hanover Square, London, W.*

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XXIII.

ÉTUDE SUR LA RENAISSANCE DE LA POLYCHRÔMIE MONUMENTALE EN FRANCE.[2]

Par Paul Sédille, Vice-Président de la Société centrale des Architectes Français, *Hon. Corr. Member.*

EN FRANCE, les traditions anciennes de la coloration extérieure des édifices se continuèrent pendant le Moyen-âge et la Renaissance en déclinant peu à peu jusqu'au règne de Louis XIV. Ces traditions nous venaient tout au moins de l'époque Gallo-Romaine. Nous croyons savoir en effet, que la plupart des monuments de cette époque étaient enrichis de peintures au dehors comme au dedans. Grégoire de Tours et plus tard Frodoard signalent les peintures qui décoraient les édifices religieux et les palais de leur temps. Les peintures de l'Église de St. Savin, près de Poitiers, sont toutefois les plus anciens témoins que nous possédions de la peinture monumentale dans notre pays. Ces peintures datent du XI^{ème} Siècle.

Les siècles suivants continuèrent largement ces procédés de décoration et nous étonnerions beaucoup la plupart des Parisiens si nous leur disions que la façade de Notre-Dame de Paris porte encore de nombreuses traces de peintures. Viollet-Le-Duc, qui a étudié de près le monument, nous apprend que non seulement les trois portes avec leurs voussures et leurs tympans étaient entièrement peintes et dorées, mais encore que les niches reliant ces portes, que la galerie des rois, que les arcades sous les tours, et que la grande rose centrale de la façade étincelaient autrefois de couleurs vives et de dorures. Les grands pignons du transsept portent également des traces de peintures. On peut faire des observations semblables sur la plupart de nos édifices religieux des 13ème, 14ème, et 15ème Siècles. Les briques, les terres vernissées ou émaillées, incrustées dans les façades ou employées sur les toitures comme tuiles, faîtières et épis, les plombs peints et dorés des combles, venaient d'ailleurs en aide à la peinture pour enrichir les édifices grands ou petits, civils ou religieux. Les plus simples habitations se paraient également de couleurs ; les pans de bois des maisons étaient peints de tons chauds, et entre les charpentes s'enchâssaient souvent des poteries et des terres vernissées comme en témoigne encore la maison de la rue du chariot d'or à Beauvais.

[2] See page 17 for the translation of M. Sédille's Paper.

Dès le commencement de la Renaissance, la polychrômie extérieure se transforme sous l'influence du goût Italien. Les colorations se subdivisent et se localisent. Ce sont des loges peintes qui s'ouvrent sur les façades souvent enrichies de dorures, de marbres, et d'émaux. Les terres cuites et émaillées sont alors en grande faveur. On s'inspire des monuments de Florence, de Bologne, de Pérouse, de Pistoja, et de toutes ces villes illustrées par les ouvrages de Luca della Robbia, de ses nombreux successeurs ou de ses imitateurs. Girolamo della Robbia, petit neveu du grand Luca, est appelé en France par François 1er, et enrichit de faïences émaillées le fameux Château de Boulogne appelé aussi de Madrid, malheureusement démoli en 1792. Quelques belles plaques recueillies au Musée de Cluny nous font voir quel était l'importance et l'intérêt de cette décoration. Du Cerceau en disait "la masse est fort éclatante à la vue." Il est certain qu'alors ce genre d'ornementation, loin d'étonner le regard, était fort apprécié.

La Renaissance Française continua donc, en les transformant et en les mettant à son goût, les traditions de coloration du Moyen-âge. Cependant, dès la fin du 16ème siècle, la polychrômie monumentale s'impose d'une façon moins absolue; elle faiblit sensiblement avec le 17ème siècle et pourtant nous la retrouvons encore, sous de nouveaux aspects, dans ces façades moitié briques, moitié pierres qui, mises à la mode sous Henri IV, caractérisent le style de Louis XIII et subsistent jusque dans les premiers temps du règne de Louis XIV. La partie centrale et la plus ancienne du Château de Versailles sur la Cour de Marbre, élevée du temps de Louis XIII et embellie de sculptures par Louis XIV, est un spécimen très-complet de cette architecture encore très-colorée.

À partir de cette époque la couleur disparaît presque complètement de la façade des édifices. On a bien conservé le souvenir d'un Trianon orné de faïences auquel se substitua le Grand Trianon actuel ; il y a encore le Château de Marly dont les nombreux pavillons alignés étaient fortement coloriés et dorés, pour cacher sans doute la pauvreté des enduits de plâtre. Mais tout cela a disparu sans laisser de traces certaines, et nous n'en parlons ici que par ouï-dire.

C'est avec le Grand Roi qu'il faut donc inaugurer cette architecture solennelle, froide et blanche importée d'Italie en France par les Jésuites et le Bernin. Bien qu'on sache le résultat final du voyage du Cavalier en France, il n'est pas moins douteux, en raison des honneurs avec lesquels il fut reçu et dont il fut comblé durant son séjour, que l'art dont il était l'illustre représentant en Italie influençait tous les artistes Français à ce moment. En imitant les grands édifices de la fin du 16ème siècle en Italie, on croyait encore s'inspirer de l'art antique Romain dont on empruntait les ordonnances colossales. Les dimensions suffisaient pour ainsi dire à la grandeur, et la forme monochrôme était seule réputée belle. On admirait l'art antique dans ses ruines, sans chercher à le reconstituer avec tous ses éléments. On oubliait, ou l'on ne connaissait pas encore suffisamment, les stucs colorés qui couvraient autrefois la nudité des grandes surfaces, les revêtements et les colonnes de marbres variés, les mosaïques des pavements et des voûtes, les riches métaux apparents, les statues de bronze, d'ivoire, ou d'or, les couvertures étincelantes qui donnaient aux monuments de la Rome Impériale une richesse

et un éclat incomparables. On restituait les monuments antiques en les dépouillant de ces splendeurs, en les réduisant à la seule beauté de leurs formes et de leurs proportions générales. Certes les monuments de l'antiquité Romaine sont assez beaux pour qu'une telle conception appauvrie de leur état ancien puisse encore exciter une admiration convaincue. Mais cette façon de comprendre l'antiquité n'en porta pas moins un coup fatal à la polychrômie monumentale non seulement en France, mais aussi dans tous les pays Européens qui prétendaient alors au culte de l'architecture.

On vit bientôt la couleur qui s'était réfugiée à l'intérieur des édifices, au temps de Louis XIV, sous forme de grande peinture décorative, déserter les salons Louis XV voués désormais au blanc sauf quelques plafonds et dessus de portes dans la gamme des tons affadis. Ce n'est pas, que nous méprisions l'art si charmant et si original de cette époque ; nous apprécions vivement au contraire les séductions et les grâces de cet art souple et facile dont, à Paris, l'ancien Hôtel Soubise (aujourd'hui les Archives Nationales) nous montre des modèles parfaits. D'autre part des monuments tels que ceux de la Place de la Concorde (autrefois Gardes-meubles de la Couronne) par l'architecte Jacques-Ange Gabriel, et celui de la Monnaie par l'architecte Jacques-Denis Antoine,—pour n'en citer que quelques-uns,—sont des chefs-d'œuvre dont nous sommes justement fiers, bien que la couleur ne soit pour rien dans leur beauté. Mais, puisque nous parlons couleur, nous devons bien constater que pendant tout le XVIII^{ème} siècle elle est à vrai dire absente de toute conception architectonique, et que l'éclipse totale de ce rayonnement est une véritable étrangeté dans l'histoire de l'architecture depuis les civilisations les plus reculées.

Nous savons aujourd'hui que tous les peuples, dans tous les temps, ont fait une large part à la polychrômie qu'ils considéraient en quelque sorte comme inséparable de tous les arts plastiques. Comment en eut-il été autrement : l'Architecture procède des grandes ordonnances, des grands aspects de la nature dont elle est une émanation directe. Or la couleur n'est-ce pas la manifestation même de la nature ? Tout ce qui frappe nos regards n'est-il pas coloré ? Imaginons-nous un objet sans une coloration qui lui soit propre ? Le blanc et le noir ne sont que des intensités de lumière ou d'ombre chargées de mettre en valeur les tonalités infinies de la couleur. Une architecture blanche monochrôme, peut donc être jugée contre nature et fait exception dans l'histoire de l'architecture humaine depuis ses plus lointaines origines.

Aussi, nous le répétons, malgré des monuments d'un grand art, assurément admirables quoique dénués de toute coloration, nous pouvons souhaiter logiquement que la couleur reprenne sur l'architecture les droits qui lui sont reconnus de toute antiquité.

Le style dit de Louis XVI ne réagit que faiblement contre ce goût persistant des murs blancs au dehors et des intérieurs clairs, réchauffés il est vrai par les douces harmonies de l'or. Quelques légères peintures ornementales inspirées soit par celles de Pompeï récemment mises au jour, soit par des ressouvenirs de la Renaissance Italienne, s'efforcèrent vainement de ramener la couleur sur les panneaux des portes et des boiseries. Le boudoir de la Reine Marie-Antoinette à Fontainebleau est un exquis spécimen de cette époque.

La période Révolutionnaire, le Directoire, et l'Empire maîtrisèrent bien vite et pour longtemps ces velléités de coloration.

Après avoir affecté quelque temps une austérité bien factice et conventionnelle, qui prétendait renouveler les monuments et les mœurs de la Rome républicaine, l'art Français se convertit rapidement au culte de la Rome des Césars pour mieux célébrer le héros couvert de gloire qui reconstituait à son profit l'Empire du Monde.

Il faut dire que l'étude plus approfondie de l'architecture Romaine, la recherche jusqu'alors négligée des monuments de la Grande Grèce et de la Sicile, portaient nos artistes vers la reproduction de formes archaïques alors toutes nouvelles, et qui par suite étaient favorablement accueillies par la mode. Car en toutes choses, et en tous lieux, la mode ne vit que de changements. Malgré la raideur pompeuse du style Impérial, l'art de cette époque ne fut pas sans mérite, et nous commençons aujourd'hui, après les avoir dédaignés, à rechercher avec sollicitude certaines œuvres et certains produits de ce temps dont nous reconnaissons les qualités savantes de composition et de tenue.

C'est qu'aussi l'art du premier Empire est représenté par deux hommes de grand talent, Percier et Fontaine. Il serait mieux encore de dire qu'il se résume dans le génie de Percier, si nous n'avions la respectueuse habitude de ne pas séparer l'un de l'autre les noms de deux hommes qui furent unis aussi bien par un sentiment commun de l'art que par les liens d'une constante amitié.

L'artiste subit le milieu dans lequel il produit. Aussi, malgré la froideur voulue des monuments de l'époque, on peut croire que Percier livré à lui-même, moins dominé par les circonstances, ne fut pas resté insensible aux charmes de la couleur. L'admirable dessin de cet artiste conservé au Louvre en témoigne. C'est la vue intérieure d'une Salle de Musée décorée, suivant le goût de la Renaissance Italienne, de peintures ornementales d'une harmonie délicate.

La Restauration, préoccupée de réparer les désastres finals de l'épopée Impériale, ne put que donner peu de soins aux travaux de l'architecture qui reste stationnaire sans tendances accentuées.

Mais la Révolution de 1830 va marquer une ère nouvelle. L'école romantique est née et avec une pleïade nouvelle d'historiens, de poëtes, d'artistes, d'archéologues, les souvenirs et les monuments de la vieille France délaissés par la Monarchie agonisante, ravagés ou dispersés par la Révolution, vont être remis en honneur et célébrés. L'attention est ainsi rappelée sur les monuments du Moyen-âge et de la Renaissance, et nos architectes vont puiser dans ces études un renouveau d'ardeur et un sentiment fécond de liberté. L'imagination de l'artiste émancipée, affranchie des formules étroites et stériles du commencement du siècle, pourra se livrer avec confiance à des conceptions nouvelles.

Les savants travaux de Vitet, de Prosper Mérimée, de de Caumont, de Didron,—et plus tard ceux de Viollet-Le-Duc,—familiarisèrent le public avec l'art du Moyen-âge. Les peintures murales des vieux édifices débarrassées des badigeons blafards des derniers siècles apparaissaient aux yeux charmés, et la couleur réhabilitée à l'intérieur des édifices devait se produire bientôt au dehors.

D'un autre côté une importante succession de travaux sur l'art antique contribua

puissamment à ce retour du goût vers les franches colorations. Il faut attribuer à ces travaux une très-large part dans cette Renaissance de la polychrômie monumentale à laquelle nous assistons.

Inspiré sans doute par les consciencieux efforts de Quatremère de Quincy pour reconstituer, d'après les textes, la Sculpture polychrôme, la Toreutique et la Statuaire Chryséléphantine chez les Grecs, Hittorff, un des premiers, rechercha la couleur sur les monuments de l'antiquité. Dès 1823 il visitait la Sicile. Ségeste, puis Sélinonte et les temples de son acropole,—déjà fouillée en cette même année, 1823, par Harris et Angell,—furent l'objet de ses études et de ses relevés. Particulièrement, il fit, du petit temple d'Empédocle à Sélinonte, une restitution bien connue par l'ouvrage qu'il publia en 1851 avec ce sous-titre *l'Architecture polychrôme chez les Grecs.*

Hittorff restitua également avec leurs colorations,—dont il avait retrouvé des traces certaines,—les trois temples qui s'élèvent à quelque distance de l'acropole de Sélinonte. Particulièrement, il présenta dans une intéressante perspective l'intérieur du temple colossal de Jupiter enrichi par un abondant décor de peintures. Mais, bien avant ces publications, il avait communiqué à l'Académie des Beaux-Arts le résultat de ses travaux et de ses observations dans plusieurs mémoires qui eurent un grand retentissement et soulevèrent aussitôt de vives et longues polémiques. S'appuyant sur les opinions de Quatremère de Quincy et sur son ouvrage *Le Jupiter Olympien;* approuvé par le sculpteur Thorwaldsen qui, en restaurant les figures du fronton du Temple d'Égine pour le prince Royal de Bavière, avait trouvé ces figures encore couvertes de nombreuses traces d'azur, de cinabre, et d'or; encouragé par le vénérable Percier lui-même; mais critiqué avec persistance par le Secrétaire de l'Académie des Beaux-Arts, Raoul Rochette, qui tout d'abord avait accueilli favorablement ses travaux ; combattu violemment par les nombreux incrédules qui ne voulaient voir dans les traces de peintures retrouvées sur les monuments Siciliens que les restes de badigeons grossiers dus aux Byzantins, aux Normands, ou aux Arabes : Hittorff vit ses opinions passionnément rejetées ou acceptées —cela pour le plus grand succès final de la polychrômie antique affirmée par toutes les études postérieures dont il reste un des promoteurs les plus incontestés.

Hittorff avait soutenu que la coloration des monuments Siciliens était une tradition de la polychrômie des monuments Grecs, aussi bien que les formes architectoniques des sanctuaires de Sélinonte, de Ségeste, de Syracuse et d'Agrigente dérivaient des temples d'Égine, d'Olympie, de Phigalie et d'Athènes. Il en concluait à la polychrômie des monuments Grecs. Les travaux des pensionnaires de l'École de Rome sur ces monuments ont définitivement donné raison aux théories d'Hittorff.

Théodore Ballu et Paccard, les premiers, quittèrent la Villa Médicis pour aller en Grèce étudier les ruines d'Athènes. Séduits par les idées nouvelles, convaincus par leurs propres découvertes, ils donnèrent en 1845 et 1847 deux restaurations très-remarquées du temple de Minerve Poliade et du Parthénon. Th. Ballu et Paccard restituèrent ces deux édifices avec un système très-complet de coloration dans des dessins admirables de sincérité et d'exécution.

Cependant, pour ne pas trop choquer le regard de leurs contemporains, encore

quelque peu rebelles aux franchises de la polychrômie antique, ils présentaient celle-ci comme attenuée par l'effet du temps, ou mieux comme elle pouvait apparaître autrefois noyée dans la lumière d'un soleil éclatant, et non avec les colorations vives des premiers temps de l'œuvre. Tétaz, reprenant en 1848 les études de Th. Ballu sur le temple d'Érechthée, accentua la polychrômie de l'édifice dans ses moindres détails. Mais c'est vraiment M. Charles Garnier qui, le premier, osa montrer la polychrômie Grecque avec l'éclat entier de ses tonalités, dans sa restauration si hardie du temple de Jupiter Panhellénien dans l'île d'Égine.

Dès lors, les pensionnaires de l'École de Rome, explorateurs de la Grèce, de son archipel et des côtes d'Asie Mineure, s'efforcèrent à l'envi de nous présenter les monuments, objets de leurs études, dans la plénitude de leur ancien effet décoratif, c'est-à-dire avec les colorations qui,—il y a plus de vingt siècles,—en faisaient valoir les formes générales, en accentuaient les détails et couvraient l'œuvre du sculpteur comme celle de l'architecte d'une parure merveilleuse, que nous avons aujourd'hui peine à concevoir, mais qui sut enchanter les yeux d'un autre âge.

Nous rappelons ici, seulement pour mémoire, les beaux travaux de MM. André (Temple de Thésée à Athènes), Lebouteux (Temple d'Apollon à Bassæ), Louvet (Acropole de Sunium), Boitte et Lambert (Acropole d'Athènes), Loviot (le Parthénon), Laloux (Olympie), Thomas (Temple d'Apollon à Didymes), Bernier (Tombeau de Mausole), Blavette (Temple de Cérès à Éleusis), &c. Ceux de nos pensionnaires de Rome qui ne quittèrent pas l'Italie y recherchèrent avec une égale ardeur les traces subsistantes de la couleur antique. Dès 1828, Henri Labrouste dans sa consciencieuse restauration de Pæstum rehaussait de quelques colorations les sanctuaires et les frontons des temples. Puis les fouilles de Pompeï mettaient chaque jour à découvert des salles peintes aussitôt étudiées et reproduites. Les anciennes peintures d'Ardée et de Lanuvium, les tombeaux peints de Corneto excitaient depuis longtemps la curiosité de nos jeunes artistes attirés également par les mosaïques des vieilles basiliques. On crut même retrouver sur certains monuments Romains, étudiés de très-près, quelques traces des colorations dont ils avaient pu être revêtus. Constant-Dufeux, après Semper, émettait cette étrange opinion que la colonne Trajane avait du être peinte entièrement. D'autre part les gracieuses décorations de la Renaissance Italienne n'étaient pas négligées.

Tous ces travaux, quelques-uns des plus remarquables, familiarisèrent le nombreux public des artistes et des amateurs avec les monuments peints de l'antiquité. Ils ont beaucoup contribué aux efforts faits depuis quelques années en France pour ramener la couleur sur nos monuments.

Hittorff ne s'en tint pas aux théories qu'il avait si chaleureusement exposées. Chargé de travaux importants, il voulut montrer l'exemple. Ses deux cirques et les petites constructions des Champs-Élysées furent rehaussés par lui de couleurs gaies. Il tenta également d'animer le portique de l'Église St. Vincent de Paul par l'éclat de peintures sur lave émaillée. Mais ces panneaux mis en place furent si fort critiqués qu'ils durent disparaître. De la polychrômie rêvée par Hittorff, la façade de St. Vincent de Paul ne garde plus que quelques traces de dorure et de coloration dans le fonds du fronton.

Ces premières tentatives ne pouvaient il est vrai qu'être imparfaites et nous devons savoir gré à Hittorff qui, en les risquant, enseigna tout au moins ce qu'il fallait éviter. Le Cirque des Champs-Élysées fut néanmoins un utile témoignage de ce que pouvait donner une décoration peinte intelligemment conduite.

Les relevés de nos architectes des monuments historiques, la restauration des vieux édifices civils et religieux, habituaient aussi peu à peu nos artistes à tirer parti des enseignements du passé et formaient une école d'habiles peintres-ornemanistes. Les églises et les châteaux d'autrefois virent se ranimer sur leurs froides murailles de pierre les chaudes colorations éteintes. L'illustre Duban, d'un talent si élevé et si délicat tout à la fois, mania, un des premiers, la couleur avec un sentiment exquis des harmonies. D'abord les travaux de restauration de la Sainte Chapelle du Palais continués par Lassus, puis la restauration du Château de Blois dont il décora les intérieurs avec une invention charmante. À l'extérieur du même château, il rétablissait quelques franches colorations qui donnent au monument une saveur toute particulière. La restauration de la galerie du Louvre, dite du bord de l'eau, qui montra le talent si souple de Duban, présente une loge peinte ouverte sur la Seine au-dessous de la galerie d'Apollon. Nous pourrions aussi parler des beaux plafonds de Duban dans ce palais comme de la noble salle qu'il décora au Château de Dampierre pour le feu Duc de Luynes. À l'École des Beaux-Arts, à Paris, Duban reproduisait les loges de Raphaël dans les galeries du 1er étage qui entourent la cour intérieure, tandis que dans la petite Cour du Mûrier il décorait les portiques de peintures dans un style Pompeïen. Mais certainement, ces imitations sont plus encore des inspirations, c'est-à-dire la création même de Duban. Placées sans cesse sous les yeux des jeunes élèves de l'École, elles ont eu sur eux une influence directe.

Dans cette même École, l'Hémicycle, et les derniers bâtiments que Duban éleva sur le quai, furent décorés, à des époques éloignées l'une de l'autre, de peintures qui indiquent les préoccupations constantes de Duban et ses goûts décidés pour la couleur.

Les marbres divers, les terres émaillées, les terres cuites, les fers apparents, ont été mis en œuvre par lui avec une grande recherche de décoration sincère et logique. Il essayait ainsi d'une polychrômie résultant de l'association de matériaux naturellement colorés.

Dans ce temps là, un de nos anciens maîtres, Constant-Dufeux, un chercheur,—nous pourrions presque dire un rêveur,—coloriait le tombeau de l'amiral Dumont d'Urville au cimetière Montparnasse et celui de la famille Alcée-Billaud au cimetière Montmartre. La façade de la petite école de Dessin élevée par lui rue de l'École de Médecine recevait également quelques rehauts de peinture. Cette modeste façade et ces tombeaux étaient d'une expression très-recherchée; aussi, malgré leur peu d'importance, nous nous souvenons que ces travaux firent sensation sur la jeune génération d'alors.

Plus tard, Constant-Dufeux éleva sur le Boulevard de Strasbourg une nouvelle façade pour l'Église St. Laurent. Il devait se raccorder avec des constructions Moyen-âge dont le style lui était peu familier. Il fit cependant là une œuvre charmante et personnelle, en harmonie avec le vieil édifice. Il décora cette façade de peintures sur lave et l'orna de dorures d'un bon effet.

Les architectes diocésains cherchaient de leur côté à restituer à nos grands édifices religieux les colorations anciennes. Viollet-Le-Duc tentait à Notre-Dame une décoration d'ensemble. Mais cette peinture générale de la vieille basilique eut peu de succès et cela avec raison. Le bariolage de la nef, du chœur, et des bas-côtés, tout ensemble était d'un effet désagréable. Viollet-Le-Duc a dit cependant, dans une monographie de Notre-Dame, que jamais autrefois l'ensemble intérieur de l'eglise n'avait été peint complètement. Comment donc fût-il poussé vers cette polychrômie absolue ? Quoiqu'il en soit, ces peintures, essayées d'une façon toute provisoire, disparurent bientôt. Seules, les peintures actuelles des chapelles latérales furent exécutées définitivement. L'insuccès de cette tentative ne doit être attribué qu'à une application imparfaite d'un bon principe.

Par contre, la décoration intérieure de St. Germain-des-Prés, exécutée par Denuelle sous la direction de Victor Baltard, et célèbre par les belles fresques d'Hippolyte Flandrin qu'elle encadre, forme un ensemble d'un vrai caractère artistique et religieux. Cette décoration fut très-favorablement appréciée dès le début aussi bien que les restaurations de Léon Vaudoyer dans les bâtiments anciens de l'abbaye de St. Martin-des-Champs dont il rétablit le réfectoire, aujourd'hui bibliothèque du Conservatoire des Arts et Métiers.

Parmi les travaux de polychrômie ou de peinture décorative exécutés sous le second Empire, il faut citer la maison Pompeïenne du Prince Napoléon. Cette fantaisie qui montra tout le savoir archéologique de l'architecte, M. Alfred Normand, fit évènement dans le public. Plus ignorés sont les travaux d'Eugène Laval qui, dans la décoration des asiles de Charenton et du Vésinet, employa, un des premiers, les terres émaillées.

Notre maître éminent, Louis Duc, dont nous ne pouvons rappeler le nom sans un sentiment de respectueuse émotion, eut peu l'occasion de faire emploi de la polychrômie. L'impassible Justice, à laquelle il élevait un palais pour tenir ses assises, se serait mal accommodée des gaietés de la couleur. Cependant Duc, esprit des plus raffinés, *dilettante* en toutes choses, était fortement épris de l'art Oriental alors que le gros du public n'y songeait pas encore.

Dans la petite villa qu'il éleva pour lui sur les bords de la Seine, à Croissy, Duc recueillit comme un lointain reflet des colorations orientales. Dans cette charmante retraite, à l'intérieur comme à l'extérieur, les peintures et les terres émaillées s'associèrent dans un décor aussi savant que recherché.

Depuis quelque temps, en effet, l'Orient envahissait l'Occident. Ses produits arrivaient nombreux sur les marchés Européens tandis que les artistes et les curieux explorant l'Égypte, l'Asie-Mineure, la Perse, l'Inde, et tout l'Extrême-Orient, faisaient connaître par des tableaux, des publications, et des photographies innombrables, les monuments jusqu'alors inconnus de ces pays des merveilles.

Après l'Italie et la Grèce, après les monuments du Moyen-âge et de la Renaissance, l'Orient apportait un argument décisif en faveur de la polychrômie monumentale.

Cette polychrômie allait aussi se transformer dans ses moyens. À l'imitation des monuments antiques la peinture avait été jusqu'alors presqu' exclusivement employée par nos artistes pour décorer l'extérieur comme l'intérieur des édifices. Et si à propos

de polychrômie monumentale s'appliquant plus particulièrement à l'extérieur comme un complément naturel de l'architecture, nous avons parlé aussi des décorations peintes à l'intérieur des monuments, c'est que l'apprentissage de nos artistes et du public s'est premièrement fait par la recherche et la vue de cette polychrômie intérieure.

Du dedans la couleur allait s'étendre au-dehors ; non plus par couches superficielles rapidement périssables en nos climats froids et humides, mais sous forme de matériaux de colorations naturelles et durables, faisant corps avec la construction elle-même.

En effet la céramique en se développant mettait bientôt au service de l'architecte des matériaux solides, nombreux et variés. Certainement depuis longtemps les produits du Moyen-âge et de la Renaissance étaient appréciés, recherchés, et imités. Dans le Château de Blois, Duban s'inspirant des types anciens avait établi des pavements en céramique d'un goût charmant. La brique, la terre cuite et émaillée étaient donc déjà habilement utilisées comme nous l'avons dit plus haut, mais toujours cependant avec une certaine réserve.

L'Exposition Universelle de 1867 mit en valeur les essais intéressants des céramistes, Anglais et Français, en même temps que les produits de la Chine et du Japon commençaient à influencer singulièrement nos industriels. De plus les *azulejos* des vieux monuments Espagnols, les revêtements en faïence des mosquées du Caire et de la Perse, sans compter les décorations éclatantes des palais Indiens, exerçaient, même à distance, une sorte de fascination certes bien explicable.

Il faut tenir compte de toutes ces circonstances pour bien apprécier la réaction qui s'accentua vers cette époque en faveur des colorations vives et franches obtenues par les matériaux naturels.

M. Charles Garnier avec son audace habituelle porta le dernier coup à la routine en introduisant largement la mosaïque dans l'architecture du Nouvel Opéra. Pour la première fois, depuis de longs siècles, la mosaïque réapparaissait en France. Ce fut une sorte de révélation, et l'exemple si bien donné a largement porté ses fruits. Non seulement les travaux des mosaïstes Italiens appelés par M. Charles Garnier se multiplièrent, mais nous devons encore aux instances de notre illustre confrère, l'École Nationale de Mosaïque fondée à Sèvres.[3] Les élèves de cette École ont exécuté, d'après les cartons de M. Hébert, la belle mosaïque qui décore depuis peu l'abside du Panthéon et les figures dessinées par M. Lenepveu qui sont le point de départ de la décoration générale en mosaïque entreprise actuellement dans le grand escalier du Louvre, sous la direction de M. Edmond Guillaume, architecte.[4]

Les travaux de M. Ch. Garnier à l'Opéra nous reportent aux années 1871 et 1872.

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[3] L'Atelier National de Mosaïque, organisé en 1876, prit, le 1er Janvier 1884, le titre de Manufacture Nationale de Mosaïque, sous la direction de M. Gerspach, Chef de Bureau des Manufactures Nationales. Il est bon de rappeler ici, qu'en 1871-72, M. Georges Berger s'occupa en Italie, pour le South Kensington Museum, de recherches et d'estampages de mosaïques anciennes. À la suite de ces travaux, M. G. Berger adressa au Marquis de Chennevières, Directeur des Beaux-Arts en France, une lettre qui fut publiée et détermina en partie la fondation de l'École Française de Mosaïque.—P. S.

[4] Voir le Rapport adressé au Ministre de l'Instruction Publique et des Beaux-Arts par M. Eugène Müntz, Conservateur de l'École des Beaux-Arts, en 1885.—P. S.

C'est vers cette époque que, revenant d'Espagne, nous faisions un large usage des terres cuites et des terres émaillées, associées avec les bois chaudement colorés, dans plusieurs constructions élevées à Paris ou aux environs, et dans le midi de la France.

Depuis cette époque, l'emploi des terres cuites et émaillées s'est généralisé aussi bien en France qu'en Angleterre. Les premières et heureuses tentatives de nos confrères d'Outre-Manche, pour mettre à profit les ressources variées de la céramique, remontaient à une date antérieure ; dès 1867, et même avant, les essais faits de l'autre côté du détroit pouvaient étonner les architectes Français. Ces essais contribuèrent à nous entrainer dans la voie déjà préparée. De telle sorte qu'aujourd'hui en France, dans les villes comme à la campagne, aux bords de la mer comme dans les stations thermales, la céramique devient le complément obligé de toute villa ou de toute construction décorative.

L'exposition Universelle de 1878 donna un grand essor à la fabrication céramique. Nous n'avons pas à rappeler ici les nombreux produits de ce genre qui sollicitèrent l'attention du public ; mais on n'a sans doute pas oublié les beaux travaux de MM. Deck et Lœbnitz dans la section Française. Ce dernier avait élevé, à l'entrée des salles des Beaux-Arts, sous notre direction et sur nos dessins, une porte monumentale, de proportions considérables, exclusivement composée de terres cuites et de terres émaillées dans le genre Luca della Robbia [Illustn. i].[5]

Vis-à-vis, M. Deck avait dressé de grands panneaux décoratifs, admirables spécimens de sa fabrication si recherchée par les amateurs, et dont les produits sont aujourd'hui dans tous les musées.

Les façades du Palais de l'Exposition par l'architecte M. Hardy et le pavillon spécial de la Ville de Paris construit par M. Bouvard se faisaient également remarquer en 1878 par des décors de céramique très-intéressants. Davioud qui mourut en 1881, peu après l'achèvement de son beau palais du Trocadero, fut aussi un partisan convaincu de la coloration des monuments. Il l'essaya par les marbres à la fontaine St. Michel, il la tenta par la peinture dans la loge ouverte du théâtre du Châtelet et sur la façade du théâtre Lyrique au moyen de deux grands médaillons en terre émaillée. Mais ces médaillons isolés sur la pierre furent si critiqués, que l'architecte, à son grand désespoir, dut les faire disparaître par ordre supérieur, et les remplacer par deux médaillons simplement sculptés. Nous rappelons ce fait, qui montre combien la couleur eut peine à s'affirmer sur les façades de nos édifices et à triompher des susceptibilités de l'œil deshabitué depuis trop longtemps de la polychrômie. Certes, les médaillons de Davioud étaient un peu trop isolés sur la façade du théâtre Lyrique, mais quoiqu'il en soit, nous nous souvenons de cette tentative qui ne nous paraissait nullement déplaisante, et nous regrettons la disparition de ces deux médaillons émaillés qui auraient été une date dans l'histoire de la Céramique monumentale.

[5] [*Voir l'Illustration* i.] A. Pilastres.—Végétations vertes, fleurs blanches, palmettes noires, rubans clairs avec inscriptions or ; le tout sur fond jaune. B. Médaillons.—Têtes en terre cuite, couronnées d'or sur fond d'azur. C. Chapiteaux.—Sphinx aux ailes émaillées de blanc avec corps fauve. D. Frise.—Bas-reliefs, tons naturels sur fond d'azur ; palmes d'or. E. Au-dessous couronnes d'or, &c. &c. F. Pilastres latéraux.—Étoiles d'or, fleurs blanches. G. Triomphe d'Apollon, dans un rayonnement d'or sur fond d'azur. H. Tore de chêne émaillé.

Dans le palais du Trocadero, Davioud et son collaborateur, M. Bourdais, purent user plus largement des marbres, des terres cuites, et des mosaïques, qui donnent à l'ensemble de leur œuvre une coloration douce et harmonieuse, d'un effet favorable.

Il serait trop long d'énumérer tous les travaux exécutés depuis 15 ou 20 ans en France, et qui témoignent d'un retour certain vers la polychrômie monumentale.

Pour affirmer cette Renaissance, il nous suffira de citer au hazard, et sans prétendre à un ordre chronologique exact, à Paris :—Les Panoramas enrichis de terres et de mosaïques par M. Ch. Garnier ;—L'Église St. Pierre de Montrouge par M. Vaudremer qui a fait là un grand emploi des terres cuites ;—Le Collège Chaptal par M. Train, dans lequel la brique et les terres cuites jouent un rôle prépondérant ;—Le tombeau de Regnault à l'École des Beaux-Arts, cette œuvre exquise de MM. Coquart et Pascal ;—La cour intérieure de la même École enrichie de très-remarquables peintures décoratives par M. Coquart ;—L'Hôtel de Ville dont la façade sur la Place Lobau a été décorée par Th. Ballu[6] de mosaïques d'une tonalité douce ;—Le Comptoir d'Escompte orné également de mosaïques par M. Corroyer, ainsi que le Théâtre des Menus-Plaisirs par M. Deslignières ;—Les Gares du Hâvre et du Champ de Mars par M. Lisch ;—Le fronton en mosaïques de la Manufacture de Sèvres, par M. Lameire, et du même artiste l'abside de la chapelle de l'Hôpital de St. Germain-en-Laye, d'après les esquisses de l'architecte, M. A. Normand. Puis les Églises de St. Augustin par Victor Baltard, de la Trinité, de St. Joseph, et de St. Ambroise, par Th. Ballu, dont les porches ont reçu quelques essais de peintures sur lave émaillée. Enfin, puisque nous énumérons seulement, les Magasins du Printemps où nous avons fait un emploi abondant des mosaïques d'émaux sur verre concurremment avec les marbres variés et les bronzes naturels ou dorés [Illustn. ii].[7]

Si nous quittions Paris, nous trouverions encore dans nos départements de nombreux essais pour y réhabiliter la couleur.

À Marseille, le regretté Espérandieu continuait la Cathédrale sur les plans de Léon Vaudoyer quand la mort hâtive est venue le surprendre. C'est M. Henri Révoil qui a eu l'honneur de décorer le porche et les intérieurs de mosaïques et de peintures. Le même architecte a décoré de mosaïques l'abside de la Chapelle de Notre Dame de la Garde à Marseille. À Monte Carlo, M. Ch. Garnier a fait usage des émaux et des mosaïques pour décorer le nouveau Casino.

Du reste renonçant à une plus longue nomenclature, nous tenons seulement à constater le caractère de cette Renaissance polychrôme. Ce n'est plus la peinture, quels que soient les procédés employés, qui, comme aux temps antiques, sous le ciel éternellement serein de l'Égypte, ou sous les climats rarement troublés de la Grèce, de la Sicile, et de l'Italie Méridionale, doit constituer la polychrômie moderne ; ce sont les matériaux colorés eux-mêmes faisant corps avec l'édifice. Eux seuls, dans nos pays le plus souvent humides, peuvent assurer la durée de la polychrômie. C'est à ces matériaux, mis en

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[6] On sait que l'Hôtel de Ville de Paris a été construit par feu Th. Ballu en collaboration avec M. Deperthes.—P. S.

[7] [*Voir l'Illustration* ii.] Un des panneaux en mosaïque du plafond du Grand Vestibule.—Végétation et rinceaux de tons verts pâles bleutés, fleurs blanches nuancées de rose, fonds d'or.

œuvre avec la logique du constructeur dirigée par le goût de l'artiste, que nous devons avoir recours.

Mais cet art renouvelé du passé n'a pas encore reçu de tous un accueil favorable si même certains artistes reculent devant les conséquences de l'union de la couleur et du relief, c'est-à-dire l'accentuation de la forme par la couleur, c'est qu'aussi toutes les tentatives déjà faites n'ont pas donné des résultats également satisfaisants.

Mais peut-il en être autrement au début d'une Renaissance qui cherche sa voie, qui ne connait pas suffisamment les moyens dont elle dispose ? et faut-il nier pour cela les principes que nous invoquons alors que la tradition de tous les pays les consacre ? Non, une mauvaise entente de la couleur ne doit pas plus nous décourager de la polychrômie, que la mauvaise architecture ne doit faire détester la bonne. Ce qu'il faut assurément, c'est que les architectes fassent un apprentissage spécial de la couleur, qu'ils en étudient les conditions d'harmonie, qu'ils en approfondissent les ressources, et qu'ils en comprennent bien le rôle pour en éviter les dangers.

Rien n'est indifférent dans l'emploi de la couleur. Le rapport des tonalités entre elles, leur intensité relative, tout peut-être troublé par une note fausse, car l'harmonie des couleurs est comparable à l'harmonie des sons. Mais la polychrômie la plus savante peut encore paraître imparfaite si elle ne sert qu'à accentuer les proportions mauvaises d'un édifice et ses formes défectueuses. L'emploi raisonné de la polychrômie doit donc avant tout inviter l'architecte à la recherche des justes proportions et à la pureté des formes.

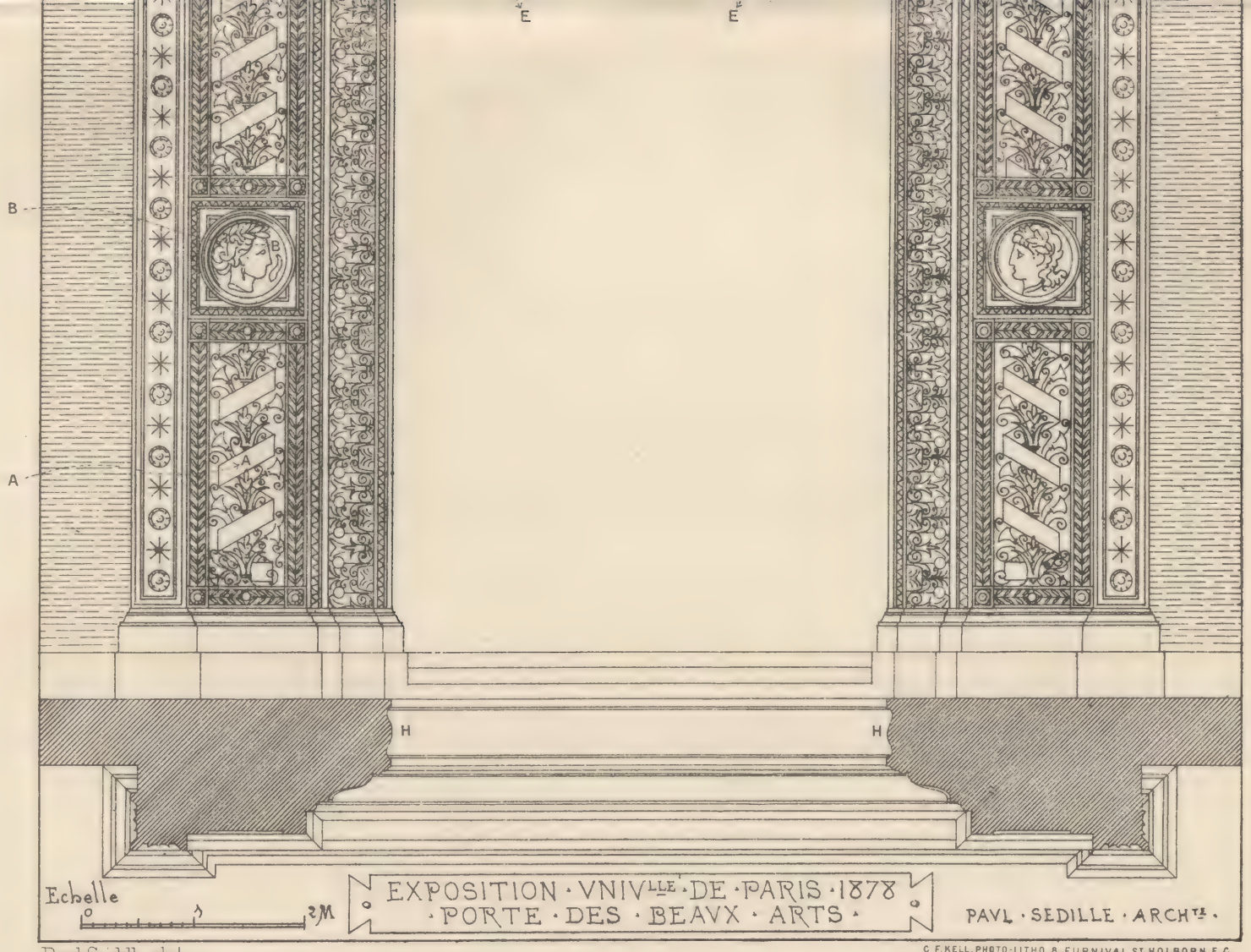
Qui sait si la beauté de certains temples antiques ne peut être en partie attribuée à l'usage constant de la polychrômie. En accentuant les éléments divers de ces sanctuaires traditionnels, la polychrômie imposait peu à peu au type primitif une sorte de perfection finale en raison de légères modifications successives dont la nécessité était révélée par l'emploi de la couleur.

La polychrômie vraie, à laquelle nous nous essayons, ne peut donc que nous aider à formuler d'une façon plus complète notre architecture contemporaine. Cette architecture, expression d'une civilisation nouvelle et de besoins nouveaux, doit être réalisée aussi bien par les matériaux naturels que par les produits si divers que la science et l'industrie mettent aujourd'hui au service du constructeur, employés avec logique et grande sincérité d'aspect. Les matériaux colorés, granits, marbres et pierres, métaux et bois, s'associeront avec les terres cuites, les émaux et tous les produits si sûrement éprouvés par le feu, pour constituer la polychrômie moderne aussi durable que les édifices dont elle sera la parure inséparable.

PAUL SÉDILLE.

XXIII. LA RENAISSANCE DE LA POLYCHRÔMIE MONUMENTALE EN FRANCE.(1).





PORTE ENTIÈREMENT COMPOSÉE DE PIÈCES DE TERRES CUITES ET EMAILLÉES AVEC REHAUTS D'OR. (p. 14).

XXIII. LA RENAISSANCE DE LA POLYCHROMIE MONUMENTALE EN FRANCE (ii).



THE PHOTOTYPE Co., 303, STRAND, LONDON.

GRANDS MAGASINS DU PRINTEMPS À PARIS.—Paul Sédille, Architecte.
Un des panneaux en mosaïque du plafond du grand Vestibule. [PAGE 15].

XXIII. (*Translation*).[8]

AN ESSAY ON THE REVIVAL OF COLOURED ARCHITECTURE IN FRANCE. By Paul Sédille, Vice-President of the Société Centrale des Architectes Français, *Hon. Corr. Member.*

THE ancient and traditional custom in France of colouring the exteriors of buildings was maintained during the Middle Ages and the Renaissance, but by the reign of Louis XIV. it had gradually declined. This custom dates back certainly as far as the Gallo-Roman era. As a matter of fact, we think we are justified in saying that the monuments of that age were for the most part enriched with paintings both externally and internally. Gregory of Tours, and afterwards Frodoard, make mention of paintings which adorned the ecclesiastical edifices and palaces of their time. Those on the church of Saint-Savin, near Poitiers, are, however, the oldest testimony we possess of monumental painting in France. They date back to the eleventh century.

Later centuries continued to employ this decorative process on a very large scale, and we should doubtless astonish the majority of Parisians, were we to tell them that the façade of Notre-Dame-de-Paris still bears numerous traces of paintings. Viollet-Le-Duc, who closely examined this edifice has told us, that not only were the three doors, with their arches and tympana, all painted and gilded, but that even the niches of the doors, the "galerie-des-Rois," the arcades under the towers, and the great central rose of the façade, were once radiant with bright colour and gilding. The large gables of the transept also bear traces of paintings. Similar remarks might be made with reference to the greater portions of our ecclesiastical edifices belonging to the thirteenth, fourteenth, and fifteenth centuries. The brick-work, the glazed or enamelled pottery set in the façades, or used in the roof as tiles, or as crestings and terminals, and the painted and gilded lead-work of roofs, further came to lend their aid to colour, and to enrich edifices both great and small, religious or secular. The simplest residences were similarly decked in colour. The wooden frontages of houses were painted in warm tints; pottery and glazed tiles were frequently encased between the beams, and an instance of this is still to be seen at Beauvais, in a house in the Rue-du-Chariot-d'or.

From the beginning of the Renaissance, external polychromy was transformed under the influence of Italian taste, colouring was subdivided and localised. We see this in the painted galleries opening on to façades often enriched with gilding, with marble, and with enamelled glass. Enamelled terra-cotta work was then in great favour. The monuments of Florence, Bologna, Perugia, Pistoja, and of all those cities famous for the works of Luca della Robbia, or his many successors or imitators, were the sources of inspiration. Girolamo della Robbia, a grand nephew of the famous Luca, was invited to France by François I, and he enriched with glazed earthenware the celebrated Château-de-Boulogne (also called the Château-de-Madrid), unhappily demolished in 1792. Several beautiful plaques, now preserved in the Musée-de-Cluny, still afford evidence of the beauty and interesting features of this example, which Du-

[8] See page 5 *ante* for the original French of M. Sédille's Paper.

Cerceau described as being "very striking to the eye." It is therefore certain that this kind of decoration, far from offending the eye, was at the time very highly appreciated.

The French Renaissance continued to transform, and to mould to its own taste, the colour traditions of the Middle Ages ; but from the end of the sixteenth century, monumental polychromy appears to be less marked ; it diminishes perceptibly with the progress of the seventeenth century, and yet, we find it again under new aspects in those fronts of half brick, half stone, which, having become fashionable under Henry IV., are characteristic of the Louis-treize period, and are still noticeable in the earlier portions of the reign of Louis XIV. The central and oldest portion of the Château-de-Versailles, the Cour-de-Marbre erected in the time of Louis XIII., and embellished with statuary by Louis XIV., is a very perfect specimen of this kind of architecture, even then highly coloured.

From this epoch, colour disappeared almost entirely from the façades of buildings. The souvenir is preserved of one Trianon decorated with pottery, which was replaced by the present Grand-Trianon ; again there was the Château-de-Marly, whose numerous pavilions, ranged in line, were highly gilt and coloured, doubtless to conceal the poverty of their coats of plaster. But all this has disappeared without leaving any certain traces, and we can only speak of it by hearsay.

It is with the era of the Grand Roi that we have to inaugurate the solemn, cold, and white architecture imported into France by the Jesuits and Bernini. Although the final result of the Cavalier's journey through France is known, it is none the less doubtful, judging from the distinction with which he was received, and the honours heaped on him during his sojourn, whether the art, of which he was the illustrious representative in Italy, influenced all French artists at that time. While imitating the great buildings in Italy of the end of the sixteenth century, they thought they were following the spirit of that ancient Roman art whose colossal Orders they borrowed. Size sufficed, so to speak, for grandeur, and form was deemed beautiful only when in monochrome. Ancient art was admired in its ruins, yet no effort was made to reconstitute it with all its elements. People, as yet insufficiently acquainted with them, forgot the coloured stuccoes which once clothed the nakedness of large superficial areas, the coverings and the columns of variegated marble, the mosaic of pavements and vaults, the rich metals exposed to view, the bronze, ivory, and golden statues, the glittering roofs, which gave to the monuments of Imperial Rome an incomparable richness and brilliancy. They restored the antique edifices by robbing them of these splendours, and by reducing them to the bare beauty of their form and general proportions. True, the monuments of Roman antiquity are sufficiently beautiful, even when thus despoiled of their ancient grandeur, to excite and compel our admiration. But this method of regarding antiquity, none the less dealt a fatal blow at coloured architecture, not in France alone, but in every country in Europe which at that time had any architectural pretensions.

The colour that had taken refuge in the interiors of structures in the time of Louis XIV., under the form of decorative painting, soon deserted the saloons of Louis XV., thenceforth all given up to white, save only a few ceilings and door-heads, which lingered on in the scale of soft, insipid tints. It is not that we despise the charm and originality of the art of this period, but rather that we are led away by the graces and seductions of that supple and easy style of which the old Hôtel-Soubise in Paris (now the Archives-Nationales) is so exquisite an example. On the other hand, monuments like those in the Place-de-la-Concorde (at one time the depository of the Crown treasures), by the architect Jacques Ange Gabriel, and the Mint, by Jacques Denis Antoine, not to mention others, are masterpieces of which we are justly proud, although colour lends nothing to their beauty. But as we are treating of colour, we should not omit to state that during the whole of the eighteenth century it is, strictly speaking, absent from every architectural design ; the total eclipse of this radiance is a veritable exception (*étrangeté*) in the historical records of architecture, from the very earliest periods of civilisation.

We now recognise that all ages, and peoples, have given polychromy a prominent place in architecture, and have to some extent deemed it inseparable from every plastic art. How could it have been otherwise ? Architecture is the outcome of the great laws and aspects of nature whence it directly emanates ; and is not colour the very manifestation of nature ? Is not every thing which arrests the eye tinted with colour ? Can we imagine an object without its appropriate colouring ? White and black are but light and shade intensified, and used as a setting whereby to convey the full effect of the infinite varieties of colour. A white monochrome architecture may therefore be regarded as unnatural and exceptional in the history of man's architectural efforts from the earliest days.

And we repeat, in spite of the monuments of a great art, truly wonderful even when denuded of colour, that we may logically hope colour will reassume over Architecture those rights which are acknowledged as having belonged to it from time immemorial.

The style called "Louis-seize" reacted feebly against this persistent taste for white walls outside, and light interiors, warmed, it is true, by the soft harmony of gold. A few paintings, inspired perhaps by some then just discovered at Pompeii, or perhaps, by the revived memories of the Italian Renaissance, were employed to impart colour to the panels of doors and wainscoting. The boudoir of Marie-Antoinette at Fontainebleau is an exquisite example of this kind of decoration.

The Revolution, the Directorate, and the Empire, rapidly and for a long time overcame these fancies for colour.

After having affected a conventional and factitious austerity, which pretended to revive the monuments and customs of republican Rome, French art soon became a convert to the worship (*culte*) of the Rome of the Cæsars, so that she might better celebrate the hero covered with glory who re-established for his own profit the Empire of the World.

It must be admitted that the most profound study of Roman architecture, the research among the monuments of Ancient Greece and Sicily, hitherto neglected, induced our artists to reproduce archaic forms, at that time quite novel, which in consequence were favourably received by fashion, for in everything, and everywhere, fashion only lives by change. In spite of the pompous stiffness of the *style Empire*, the art of this period was not wanting in brilliancy, and we are now beginning, after having despised them, to seek again for certain works and productions of that period, in which we now recognise masterly qualities of composition.

Moreover, the art of the First Empire is represented by two talented men, Percier and Fontaine. It would perhaps be more correct to say that it is summarised in the genius of Percier, were it not that, by courtesy, it is more usual to link the names of these two men, united as much by mutual artistic sentiments as by the ties of constant friendship.

The artist is affected by the surroundings in which he produces; and yet even in the face of the prescribed coldness of the monuments of the period, we are justified in assuming that had Percier been left to himself, and been less influenced by circumstances, he would not have been unmoved by the charms of colour. His admirable design, preserved in the Louvre, is a proof of this. It represents the interior of a Salle-de-Musée decorated in the style of the Italian Renaissance, with ornamental paintings remarkable for their delicacy and harmony.

The Bourbon Restoration, preoccupied in repairing the final disasters of the Imperial *épopée*, could give slight heed to architecture, which remained stationary,—uncharacterised by any particularly marked tendencies.

But the Revolution of 1830 was about to signalise a new era. The Romantic school came into existence with a new pleiad of historians, poets, artists, and archæologists; and the souvenirs and monuments of our old France, abandoned by the dying Monarchy, pillaged or scattered by the Revolution, were again to be enthroned and honoured. Attention was thus called to the monuments of the Middle Ages, and to those of the Renaissance, and in studying them our architects were to imbibe renewed ardour, and inspirations pregnant with freedom. Once freed from the bigoted and fruitless formulas of the commencement of the century, the unfettered imagination of the artist would freely soar to new ideas.

The learned works of Vitet, of Prosper Mérimée, of de Caumont, of Didron, and, later on, those of Viollet-Le-Duc, familiarised the public with mediæval art. Wall paintings reappeared to charm the eye in old structures freed from the sickly whitewash of previous centuries, and colour, which had found its way back to interiors, was soon to be produced on exteriors.

On the other hand, a succession of important works on ancient art contributed very powerfully to this return of taste for deep colouring. To these works is due in a great measure this renaissance of coloured architecture at which we are assisting.

Inspired doubtless by the conscientious efforts of Quatremère de Quincy to re-establish to the letter polychromatic sculpture, the Toreutic and Chryselephantine statuary of the Greeks, Hittorff was one of the first to search for colour on the monuments of antiquity. He visited Sicily in 1823. Segesta, and afterwards Selinus and the temples of its Acropolis, already explored in the same year by Harris and Angell, were the objects of his studies and the theme of his reports, and to particularize,

he made a restoration of the small Temple of Empedocles at Selinus, well known by the work entitled *L'Architecture Polychrôme chez les Grecs*, which he published in 1851.

Hittorff in like manner restored with their colouring—undoubted traces of which he had found—the three temples which stand close to the Acropolis of Selinus. Deserving of especial notice was an interesting view which he produced of the interior of the colossal Temple of Jupiter, enriched with an abundance of decorative painting. But long before publishing these works, he had communicated to the Académie-des-Beaux-Arts the result of his labours and observations, in several papers, which created a great sensation, and at once gave rise to long and animated discussions. Sustained by the opinions of Quatremère de Quincy, and by his work *Le Jupiter Olympien*; encouraged by the sculptor Thorwaldsen, who—while restoring the figures on the façade of the Temple of Ægina for the Prince Royal of Bavaria—had found them still covered with numerous traces of azure, vermilion, and gold; stimulated by the venerable Percier himself, but persistently criticised by Raoul Rochette, the Secretary of the Académie-des-Beaux-Arts, who had at first warmly seconded his efforts; violently opposed by the numerous sceptics who refused to recognise in the traces of paintings discovered on Sicilian monuments other than the remains of vulgar daubs of Byzantine, Norman, or Arab origin,—Hittorff saw his opinions passionately rejected or accepted, their rejection only conducing to the greater final success of the affirmation of the practice of ancient polychromy from all subsequent studies, of which Hittorff was unquestionably one of the foremost promoters.

Hittorff had maintained that the colouring of the Sicilian monuments was a tradition of the polychromy of ancient Greek monuments, also that the architectural forms of the sanctuaries of Selinus, of Segesta, of Syracuse, and of Agrigentum, owed their origin to the Temples of Ægina, of Olympus, of Phigaleia, and of Athens. Thence he deduced the polychromy of Grecian monuments. The labours of the students in the École-de-Rome on these monuments have conclusively proved the accuracy of Hittorff's theories.

Théodore Ballu and Paccard were the first who left the Villa-Médicis for Greece, to study the ruins of Athens. Enchanted by the new theory and convinced by their own discoveries, they made in 1845 and 1847 respectively two very remarkable restorations, namely: the Temple of Minerva Polias and the Parthenon. Th. Ballu and Paccard restored those two edifices, with a most complete system of colouring, in drawings which were admirable both for their fidelity and for their execution.

But in order not to shock their contemporaries, whose views were still somewhat hostile to the freedom of ancient polychromy, they presented it as though faded from the effects of time, or rather as it might have appeared formerly, drowned in the light of a dazzling sun, and not with the bright colouring of a newly finished work.

In 1848 Tétaz, resuming the studies carried on by Th. Ballu at the Erechtheum, marked the polychromy of the structure to its minutest details. But M. Charles Garnier was really the first who had sufficient courage, in his bold restoration of the Temple of Jupiter-Panhellenius in Ægina, to display Grecian polychromy in all its pristine brilliancy of tone.

From that time forward, the students of the École-de-Rome, explorers of Greece, of its archipelago, and of the coast of Asia Minor, laboured earnestly to place before us those monuments which were the objects of their researches, in all the plenitude of their original decorative effect, that is to say, in the colours which—more than twenty centuries before—enhanced the beauty of form, accentuated its detail, and arrayed the work of both sculptor and architect in a marvellous attire, difficult to realize at the present day, but one which enchanted the eyes of another age.

We may here cite as a reminder the beautiful works of MM. André (Temple of Theseus at Athens) of Lebouteux (Temple of Apollo at Bassæ), of Louvet (Acropolis at Sunium), of Boitte and Lambert (Acropolis of Athens), of Loviot (The Parthenon), of Laloux (Olympia), of Thomas (Temple of Apollo at Didymi), of Bernier (Tomb of Mausolus), of Blavette (Temple of Ceres at Eleusis), &c. Those of our *Pensionnaires-de-Rome* who remained in Italy continued with equal ardour their researches for existing traces of ancient colour. Besides these, in 1828, Henri Labrouste, in his conscientious restoration of Pæstum, relieved with colour the sanctuaries and the pediments of the temples. Again, the excavations at Pompeii were daily bringing to light painted apartments which were immediately studied and reproduced. The old paintings at Ardea and Lanuvium, and the painted tombs at Corneto, had long excited the curiosity of our young artists, for whom the mosaics in the old basilicas offered like attractions. They thought they had discovered, in closely examining certain Roman monuments, some traces of the colouring with which they had in all probability been adorned. Constant-Dufeux,

following the strange opinion of Semper, stated his belief that Trajan's Column must have been at one time entirely painted. On the other hand, the graceful decorations of the Italian Renaissance were not overlooked.

All these works, some of them most remarkable, familiarised a numerous public, both of artists and amateurs, with the painted monuments of antiquity, and contributed in a great measure to the efforts which had been made for some years in France to reintroduce colouring on our edifices.

Hittorff did not restrict himself to the theories which he had so warmly expounded ; when commissioned to carry out important works he desired to set the example. His two Cirques and the small structures in the Champs-Élysées, were all relieved by him with bright colouring. He also tried, in like manner to enliven the portico of the Church of Saint-Vincent-de-Paul by brilliant colouring on enamelled lava, but these panels when erected did not survive the severe criticism to which they were subjected ; of the polychromy dreamt of by Hittorff, the façade of Saint-Vincent-de-Paul retains now only a few traces of gilding and colouring in the pediment.

These first attempts were necessarily imperfect, and we ought to be grateful to Hittorff, who, in venturing on them, taught us, at least, what to avoid. Nevertheless, the Cirque in the Champs-Élysées was a valuable testimony to the effect produced by decorative painting when intelligently carried out.

Architectural drawings of historical monuments and the restoration of ancient structures, both secular and religious, also gradually accustomed our artists to profit by the lessons of the past, and establish a school of able decorative painters ; the cold stone walls of the churches and châteaux of a former generation were again radiant with tints that had long before faded. The illustrious Duban, whose talent was at once so exalted and so delicate, was one of the earliest to manipulate colour with an exquisite sense of harmony. First we have his restoration of the Sainte-Chapelle, which was continued by Lassus ; then that of the Château-de-Blois, the interiors of which are adorned with charming invention. On the exterior of the same château he restored some bold colouring, which gives the structure an aspect altogether unique. The restoration of the Galerie-du-Louvre, called "du-bord-de-l'eau," which showed the adaptability of Duban's talent, gives us a painted "loge," open towards the Seine, under the Galerie-d'Apollon. We might also allude to Duban's lovely ceiling in the same palace, and the noble hall at the Château-de-Dampierre, which he decorated for the late Duc de Luynes. Duban reproduced, at the École-des-Beaux-Arts, Paris, the "Loggie di Rafaele" in the galleries on the first storey surrounding the inner court, while he also decorated the porticos in the small Cour-du-Murier with paintings in a Pompeian style. Yet surely these reproductions are more than imitations ; they are inspirations, even creations of Duban ; and the young students, who have had them constantly before their eyes, have felt their direct influence.

It was in this very school that the Hémicyle, and the last structures built by Duban on the quay, were decorated at periods widely apart from one another, yet the decorations consist of paintings which indicate Duban's constant preference, and decided taste, for colour.

Marble, enamelled pottery, terra-cotta, and iron, were used by him, with much research of decoration, truthfully and logically. In this way he tried polychromy by means of materials coloured by nature.

At that time one of our old Masters, Constant-Dufeux—a searcher, a dreamer, one whom we might almost call Utopian in his aspirations—coloured the tomb of Dumont d'Urville at the Cemetery of Montparnasse, and that of the Alcée-Billaud family at Montmartre. The façade of the small École-de-Dessin erected by him in the Rue-de-l'École-de-Medecine was also embellished by touches of painting. This modest façade and these tombs are most refined in expression ; and, though unimportant in themselves, we well remember that they created a sensation on the young generation of the period.

Later on, Constant-Dufeux added a new façade to the Church of Saint-Laurent on the Boulevard-de-Strasbourg. He had to adapt himself to the mediæval style, with which he was not familiar, yet he produced a charming and characteristic work, thoroughly in harmony with the old building. He decorated this façade with paintings on lava, and ornamented it with effective gilding.

The diocesan architects, on their part, sought to restore to the great religious edifices their ancient colouring. Viollet-Le-Duc attempted at Notre-Dame a general decoration, but this style of painting in the old cathedral deservedly met with slight success. The medley of colours in the nave, choir, and aisles, produced an unpleasant effect. Viollet-Le-Duc, however, in a monograph of Notre-Dame, has himself remarked, that in former times the whole interior of the cathedral had never been completely

painted. What then drove him to this absolute polychromy? Be it as it may, these paintings, temporarily tried, soon disappeared. The only paintings that were definitely completed were the present ones, in the side chapels. The failure of this attempt may be in some measure attributed to the imperfect application of a good principle.

On the other hand the decoration of the interior of Saint-Germain-des-Prés, executed by Denuelle under the direction of Victor Baltard, and famous for the beautiful frescoes of Hippolyte Flandrin which form a part of it, possesses, as a whole, a character truly artistic and religious. This decoration was from the first very favourably received, and the same may be said of Léon Vaudoyer's work at the Abbey of Saint-Martin-des-Champs, in which he restored the refectory now used as the library of the Conservatoire-des-Arts-et-Métiers.

Among the works of polychromy, or decorative painting, executed under the Second Empire, the Pompeian house of Prince Napoleon should be mentioned. This flight of fancy, which displayed all the archæological learning of the architect M. Alfred Normand, was an event in the history of the time. Less known are the works of Eugène Laval, who, in decorating the asylums at Charenton and of Le-Vesinet, was one of the first to employ enamelled pottery.

Our eminent Master, Louis Duc, whose name we cannot recall without a feeling of respectful emotion, had few opportunities of using polychromy. Stern Justice for which he erected a palace wherein to hold its sessions, would have been ill suited to gay colouring. Nevertheless, Duc, endowed with one of the most refined minds, and *dilettante* in all things, was strongly attached to Oriental art, before the mass of the public had given it a thought.

In the little villa which Duc built for himself at Croissy, on the banks of the Seine, he garnered up, as it were, a distant reflection of Oriental colourings. In this charming retreat, paintings and glazed tiles combined to produce a decorative effect, both internally and externally, which was as cultured as it was refined.

In fact, for some time the East had been invading the West. Her products were coming in large quantities into European markets, while artists and antiquaries were exploring Egypt, Asia Minor, Persia, India, and all the far East, familiarising the public, by means of pictures, works, and innumerable photographs, with the hitherto unknown monuments of those wonderlands.

After Italy and Greece, after the monuments of the Middle Ages and of the Renaissance, the East supplied a conclusive argument in favour of coloured architecture.

This polychromy was also about to be modified in its means. In imitation of antique monuments, painting had so far been almost exclusively used by our artists for decorating exteriors as well as interiors; and if in alluding to colour, when applied to exteriors, as a natural complement of architecture, we have also spoken of painted decorations in interiors, it is because the apprenticeship of our artists and of the public was first served in the research, and by the example, of this internal polychromy.

Colour was about to extend itself from within to without; no longer by superficial coats which would rapidly fade in these cold damp climates, but under the form of coloured materials, natural and durable, and forming part of the construction itself.

In fact, the development of ceramics soon placed at the disposal of the architect a varied and abundant supply of solid materials. True, the products of the Middle Ages and of the Renaissance had long been valued, sought after, and imitated. In the Château-de-Blois, Duban, taking his inspiration from the ancient models, had employed ceramic tiles with charming effect. Brickwork, terra-cotta, and glazed tiles had already been skilfully used as we have said above, but always with a certain reserve.

The Exposition-Universelle of 1867 gave prominence to the interesting efforts of English and French art-potters, at the time when Chinese and Japanese products were beginning to exert a marked influence on our manufacturers. Besides this, the *azulejos* of the old Spanish monuments, the tile facings of the Mosques of Cairo and Persia, to say nothing of the dazzling decorations of the Indian palaces, exercised even at a distance a sort of fascination easily accounted for.

All these circumstances must be taken into consideration in order to understand the marked reaction which became manifest about this period in favour of bright and bold colouring, obtained by the use of natural materials.

M. Charles Garnier, with his usual intrepidity, struck the final blow at routine by the introduction of mosaics on a large scale in the architecture of the New Opera House. For the first time, for many

centuries, mosaic work re-appeared in France. It was a kind of revelation, and the excellent example has borne abundant fruit. Not only have the mosaic works of the Italian artists, brought over by M. Charles Garnier, increased, but we are further indebted to the persistence of our illustrious confrère for the École-Nationale-de-Mosaïstes, founded at Sèvres.[9] The students in this School, copying M. Hébert's cartoons, have executed the beautiful mosaic which has only recently adorned the apse of the Panthéon [in Paris], and the figures designed by M. Lenepveu which constitute a point of departure for the general decoration in mosaic now being executed in the Grand Staircase of the Louvre, under the direction of M. Edmond Guillaume, architect.[10]

The works of M. Charles Garnier at the Opera House carry us back to the years 1871 and 1872. It was about that time, on returning from Spain, that we largely employed terra-cotta and glazed tiles, in combination with wood highly coloured, in several buildings erected in Paris and its environs, and also in the South of France.

From that time the use of terra-cotta and glazed tiles has become general both in France and England. The early and successful endeavours of our confrères on the other side of the channel, to utilise the varied resources of the potter's art, date back to an earlier period; the efforts made in England since, and long anterior to, the Exposition-Universelle of 1867 might astonish French architects. These efforts contributed to lead us into the way already prepared,—so much so, that at the present day in France, both in town and country, on our coasts and in our inland watering places, ceramics have become the essential complement of every villa and every decorative structure.

The Exposition-Universelle of 1878 gave a great impetus to the manufacture of ceramics. We need not enumerate here the numerous products of this class which have claimed public attention; but the beautiful works of M. Deck and M. Loebnitz in the French Section are doubtless still remembered. The latter had erected at the entrance of the Salles-des-Beaux-Arts, under the author's direction and from his designs, a monumental doorway of considerable proportions, composed exclusively of terra-cotta and glazed tiles, of the Luca della Robbia kind [Illustn. i].[11]

Opposite this, M. Deck displayed some large decorative panels, which were admirable specimens of his manufacture, so much sought after by amateurs, and examples of which are now in every museum.

The façade of the Palais-de-l'Exposition of 1878 by the architect M. Hardy, and the special Edifice of the City of Paris, constructed by M. Bouvard, alike attracted attention on account of the highly interesting decorations. Davioud, who died in 1881, shortly after the completion of his beautiful palace at the Trocadero, was also a thorough convert to the colouring of buildings. He essayed it in marble at the Fontaine-Saint-Michel, he tried it with a painting on the open gallery of the Théâtre-du-Chatelet, and on the façade of the Théâtre-Lyrique with two large medallions in glazed tile. But these isolated medallions on stone were so criticised, that the architect to his great grief was compelled to remove them, and replace them by two plain sculptured medallions. We recall this fact, in order to show with what difficulty colour asserted itself on the façades of our buildings, and triumphed over the susceptibility of the eye so long unaccustomed to polychromy. It is true that Davioud's medallions were somewhat too isolated on the façade of the Théâtre-Lyrique, but be that as it may, we remember that the attempt seemed to be in no way unpleasing to us, and we regret the disappearance of these two medallions which would have formed a landmark in the history of architectural ceramics.

In the Trocadero Palace, Davioud and his co-adjutor, M. Bourdais, freely employed terra-cotta, marbles, and mosaics, which give to their work, as a whole, a soft, harmonious, and an effective colouring.

[9] This Institution, started in 1876, took the name, in January 1884, of "Manufacture-Nationale-de-"Mosaïque," under the direction of M. Gerspach. It is only right to mention here that M. George Berger, who was employed by the authorities of the South Kensington Museum in 1871-72, to study the ancient mosaics in Italy, and collect rubbings of them, applied, at the conclusion of his engagement, to the Marquis de Chennevières, the Director of the Fine Arts in France; and his letter, which was published, led to the foundation of the French École-de-Mosaïque.—P. S.

[10] See a Report submitted to the Minister of Public Instruction, Fine Arts, &c., by M. Eugène Müntz, Curator of the École-des-Beaux-Arts in 1885.—P. S.

[11] [*See the Illustration* i.] A. PILASTERS.—Green vegetation, white flowers, black palm-leaves, light ribbons with gold inscriptions; the whole upon yellow ground. B. MEDALLIONS.—Heads in terra-cotta wreathed with gold upon azure ground. C. CAPITALS.—Sphinx, with wings enamelled white and body pale red. D. FRIEZE.—Bas-relief in natural tones upon azure ground; palms of gold. E. Wreaths of gold, &c. &c. F. SIDE PILASTERS.—Gold stars, white flowers. G. Triumph of Apollo, rays of gold upon azure ground. H. Oak torus enamelled.

It would take too long to enumerate here all the works executed in France during the last fifteen or twenty years which are evidence of an assured return to coloured architecture.

As a proof of this renaissance it will be enough if we mention promiscuously, and without any attempt at exact chronological order, the following works in Paris :—The Panoramas enriched by M. Ch. Garnier with pottery and mosaics ; the church of Saint-Pierre at Montrouge by M. Vaudremer, in which terra-cotta is employed on a large scale ; the Collège-Chaptal by M. Train, in which brick-work and terra-cotta play an important part ; the tomb of Regnault at the École-des-Beaux-Arts, an exquisite piece of work by MM. Coquart and Pascal ; the inner court of the same building, enriched by M. Coquart with some very remarkable decorative paintings ; the Hôtel-de-Ville, the façade of which, facing the Place-Lobau, has been decorated by Th. Ballu[12] with mosaics characteristic for the softness of their tone ; the Comptoir-d'Escompte similiarly ornamented with mosaics by M. Corroyer, as well as the Théâtre-des-Menus-Plaisirs by M. Desligniéres ; the Havre Railway Station and that of the Champ-de-Mars by M. Lisch ; the mosaics in the pediment of the Manufacture-de-Sèvres by M. Lameire, and by the same artist the apse of the chapel at the Hôpital of Saint-Germain-en-Laye, from the designs of M. Alfred Normand ; then the Church of Saint-Augustin by Victor Baltard, and those of the Trinité, of Saint-Joseph, and of Saint-Ambroise by Th. Ballu, the porches of which have received some attempts at paintings on enamelled lava. Finally, since we are merely cataloguing, the Magasins-du-Printemps in which the author has largely used mosaics of enamelled glass, conjointly with variegated marbles, and with plain and gilt bronze [Illustn. ii].[13]

Were we to go into the provinces we should there find other numerous instances in which efforts have been made to revive colour.

The lamented Espérandieu was continuing the Cathedral at Marseilles, from the plans of Léon Vaudoyer, when an untimely death took him from our midst, and to M. Henri Révoil fell the honour of decorating the porch and interior with mosaics and paintings. The same architect has decorated with mosaics the apse of the Chapelle of Notre-Dame-de-la-Garde, at Marseilles. At Monte Carlo, in the decoration of the new Casino, M. Ch. Garnier has also used enamels and mosaics.

In conclusion, we will not add to the list, but limit ourselves to defining the character of the renaissance of polychromy. It is no longer painting, whatever be the methods employed, which, as in olden times, under the ever serene skies of Egypt, and the rarely troubled climates of Greece, of Sicily, and of Southern Italy, must constitute modern polychromy ; but the coloured materials themselves which form a part of the actual structure. In countries like ours, for the most part damp, these are the only elements which can secure a lasting polychromy. It is to these materials, employed with the logic of the constructor, directed by the taste of the artist, that we must have recourse.

This art, however, revived from the past, has not been received with unanimous approval so far ; indeed, if a few artists are discouraged by the results of the combination of colour and relief, that is to say, the accentuation of form by means of colour, it is also true that the attempts hitherto made have not all given results equally satisfactory.

But could it be otherwise in the initial period of a renaissance which is as yet only feeling its way, and is only imperfectly acquainted with the means at its disposal ? And shall we therefore deny the principles which we invoke, when the traditions of all countries consecrate them ? No, a misconception of colour should no more discourage us from polychromy, than bad architecture should set us against good. What is really wanted is, that architects should serve a special apprenticeship to colour, and study the laws of harmony ; that they should fathom its resources, and thoroughly understand the part it plays, so as to avoid its abuse.

Nothing is unimportant in the employment of colour. The mutual relation of tones, and their relative intensity, may be completely subverted by a single false note ; for harmony in colour is like harmony in sounds. At the same time the most skilful polychromy may still appear imperfect, if it only serves to accentuate the faulty proportions and defective forms of a building. The rational use of polychromy should therefore induce the architect to seek for accuracy in proportion, and purity in form.

Who knows whether the declared beauty of certain ancient temples may not have been partially due

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[12] It is known that the new Hôtel-de-Ville of Paris was erected from the designs of Th. Ballu, in conjunction with M. Deperthes.—P. S.

[13] [*See the Illustration* ii]. ONE OF THE PANELS IN MOSAIC OF THE CEILING OF THE *GRAND VESTIBULE*. —Vegetation and foliage of pale green tones, white flowers shaded with rose, gold ground.

to the constant use of polychromy? While accentuating the various elements of these traditional sanctuaries, polychromy, perhaps, gradually endowed the primitive style with a sort of final perfection, by reason of slight successive modifications, the necessity for which was revealed by the employment of colour.

The true polychromy at which we aim can therefore only assist us in formulating more thoroughly our contemporaneous architecture. This architecture, the expression of a new civilisation and of new requirements, should be realised as much with natural materials as with the varied products which science and industry now place at the disposal of the constructor, employed with logic and honest harmony of aspect. Coloured materials, such as granite, marble, stone, metal, and wood, allied with terra-cotta, enamelled pottery, and all the fire-tested products, will render modern polychromy as lasting as the edifices of which it will be, one day, the inseparable adornment.

(Signed) PAUL SÉDILLE.

[Note by Mr. John D. Crace.]

Monsieur Sédille's Paper must be regarded as dealing chiefly with the external colouring of architecture in France—primarily by a brief historical retrospect; then by a sketch of its revival within our own time; and, finally, by a consideration of the conditions under which its use may be successfully adopted in our own time, and in a climate not very unlike our own.

It is, perhaps, profitable for us, in discussing the latter part of this very interesting Paper, to consider it from an English standpoint; and throughout to make comparison with the exercise of the same art in other neighbouring countries. So far as mediæval architecture is concerned, the use of colour was probably on almost parallel lines throughout northern Europe, whether in France, Germany or England. The western porch at Salisbury exhibits as ample traces of colour as the western porch of Notre-Dame-de-Paris (of the same period); and if our rougher climate has left no traces of colour or gilding on the more exposed features of the main façade, it is quite probable that the colour and gilding were not confined to one isolated feature, but were carried at least so far as to express the more sacred groups of sculpture, or the more elaborate foliage ornament. The influence of Italian artists was constantly renewed both in France and England, but in France particularly. In England our larger commerce with Flanders and the northern Rhine was, in the matter of style, a counteracting influence.

It seems singular, considering the large intercourse of Venice and Rome with both countries, that the use of mosaic as a means of polychromy did not find its way into either France or England during the 13th, 14th, and 15th centuries, when it was largely used in Italy. Nor did the use of alternately coloured stones ever seem to gain much footing as a means of producing effect on a large scale. Perhaps this last may be explained by the fact that without strong light and shadow this method of building in colour loses much of its charm. Here, and in France, the attached colonnette was almost the only feature in which the use of a separate material of contrasting colours was generally admitted. Yet in the interior of Norman buildings we find the principle of striated, alternate colouring recognised in the painted decoration of the arches and other features.

In Germany, during the later mediæval period, external colouring was perhaps more resorted to than in either France or England; and in the recent revival of the use of colour, both internally and externally, Germany has taken a very active and leading part. The decorations of S. Bonifacio at Munich belong, it must be remembered, to the first half of this century, and to the same period as the restored colouring of the Sainte-Chapelle, Paris. The great frescoes of Cornelius, which decorate the exterior of the old museum at Berlin, are of about the same period, and exceed in importance any external work of that time in France.

In both France and Germany the execution of really important works in polychromy on public buildings has been worth dozens of schools of art: for it is in the execution and result of actual work that the student can really grasp what he seeks. The care and trouble taken by the French in the execution of even a simple scheme of coloured decoration (if in an important building) would very much astonish many English architects and artists. Experiment after experiment must be made, and the utmost niceties of form or tone must be adjusted, before the work can proceed to completion; and this

is the only way of arriving at success in colour, for I am convinced that the same colour will never look the same in any two positions.

As regards external colouring for buildings, of at all a monumental or important character, M. Sédille has, I think, pointed out the right road in suggesting that it is in the permanent colour of the actual building materials that we have the best promise of success. But in unimportant and cheaper buildings something may still, I think, be achieved externally with the brush. I cannot allow that the stucco which was found so useful in other ages, and other countries, and which is so efficient a protector against damp, need be absolutely discarded in the erection of dwelling houses; and where stucco is used, colour may help. Many a plastered front might be made agreeable at least by skilfully-used colour. What we have to remember is that under a grey sky a bright scale of colour will look tawdry, just as coloured flags look tawdry on a wet day. The gay colours of an Indian crowd, would appear very different in a London street to what they do under an Indian sun, with its brilliant light and sharp shadows.

The adjustment of the "key," or scale of colour, to climate and surroundings is a very important factor in the success of external colouring. A climate in which grey skies prevail need not preclude the use of rich and deep colours, when these are used in contrast with sober tones; but it does preclude the use of an altogether bright and gay scale, and of sharp contrasts of bright colours, which might be quite harmonious under a dazzling sun. How far this distinction may be attributed to the difference in the density of the shadows, or to the contraction of the iris of the human eye when exposed to strong lights, is perhaps worth a careful enquiry.

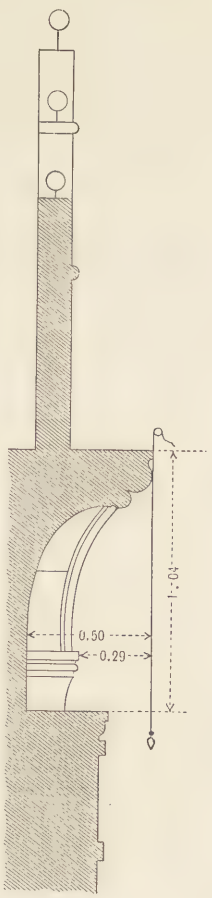
JOHN D. CRACE.

XXIV.

THE CA' D'ORO AND ITS POLYCHROMATIC DECORATIONS.

By Giacomo Boni, *Hon. Corr. Member* (Venice).

TWO years ago, when the façade of the Ca' d'Oro was covered with scaffolding for the restorations, I examined the battlements, which had always seemed to me anomalous and even possibly a restoration, but I found them to be original, bearing marks and Gothic initials. Between the base of the battlements and the top of the small cornice of the windows of the second floor, projecting from the surface of the plaster, are still to be seen remains of the arches, with rosettes in their spandrils, and of the supporting brackets, which formerly sustained the crowning cornice. These remains may even be distinguished in photographs, but they may be better studied on the spot, from a piece of cornice still intact on the side of the palace facing the small *calle* to the east. There it may be seen [see Diagram] that each cusped arch, one to each pinnacle of the battlements, formed a curved niche, and also curves outwards, supporting the cornice of rope-moulding with alternate concave strands, above which rest the battlements [Illustn. iv].



The richness of this cornice may be explained from the other decorations of the Ca' d'Oro, which show a desire on the part of the builders to obtain the greatest luxury possible in the domestic architecture of the first years of the fifteenth century,—a date which we may at once establish, although more ancient sculptures built into the façade give it an appearance of greater age. We have but to consider the general structure of the building, the pilasters bordered with dentils, the rope mouldings, and the window arches already foliated at the top, together with the richness of the foliation, which seems more to delight in its own luxury than to consider its decorative use. From this intemperance of ornament (as Mr. Ruskin would call it) we know that the rebuilding of the Ca' d'Oro was contemporary with that of the Piazzetta façade of the Ducal Palace [Illustn. v].

When studying the façade of the Ca' d'Oro I noted also the remains of its primitive polychromatic decorations, and found there several traces of gilding on the foliage and the projecting mouldings, and discovered furthermore that their concave portions and the hollows of the foliage were formerly coloured blue and red.

I had had no other opportunity of occupying myself with the Ca' d'Oro and, beyond the cornice and colour, my study of this graceful building offered little that was not already known; and I should have kept it for my private use, had not one of the most active members of our Historical Society, Bartolomeo Cecchetti, the Superintendent of the State Archives, found among the papers of the Procurators of S. Mark's (*Serie Misti*, b. 123, No. 1) the original memoranda of the nobleman Contarini, for the construction of his house at S. Sophia, which we find to be the palace called the Ca' d'Oro (Golden House). The notes start from the year 1424, when John Bon (the architect of the Porta della Carta) began to work for Contarini, with his son Bartholomew and his assistants Zane and Rosso, binding himself to work for one year dating from the fourth of August, at the rate of 140 golden ducats. Some special accounts, for the labour of the masons, show that the work was conducted by the proprietor himself; though at the end are two contracts, one of which relates to the working of the cornice with the crowning battlements, and the other to the final gilding and colour decoration.

These two documents have been published in the *Archivio Veneto* (t. xxxi., p. 1, 1886). In reading them, through the acquaintance I had made of the Ca' d'Oro, and the daily familiarity with the dialect of the workmen, I have been able to recognise each part described, and though many of the words belong to the Gothic vocabulary, and have long been in disuse, I was able to trace their meaning from the things described, which I knew already; and I hardly know whether the documents interested me the more because they explained details of the construction, or because they contained so many technical terms of the ancient Venetian dialect which the building itself explained. I was always forced to remember the lapse of time in order not to consider them contemporaneous, for in the 15th century, when every family possessed its own documents, these would have had no more value than others, but for the importance of the building; while to us they remain among the few relics of ancient inscriptions and records, which contribute to the history of art.

Let us then turn at once to the documents in question, giving each paragraph in brief English translation, and adding such explanatory notes as may be necessary, thus:—

In Christi nomine amen. MCCCCXXX adi XX avril in Veniexia.

Questo se lo lavorier che vol far far Miser marin chontarini de miser antuonio el procholator in la faza de la sua chaxa granda[1] *messa in santa sofia sora chanal grando de maistranza de taiapiera.*[2]

Venice, April 20th 1430.

Work of stone-cutting for Ser Marino Contarini, of Ser Antonio, Procurator, in the front of his palace at S. Sophia, on the Grand Canal.

(1). *Chaxa granda, i.e.* palace, literally big house, to distinguish it from some smaller ones of the kind on the Canal, or because such was the common name of the palaces at that day.

(2). *Maistranza de taiapiera, i.e.* workmanship of a "stone-cutter," the common name of masons and sculptors. In the contract of the same John Bon for the erection

of the Porta della Carta, dated 10th November 1438, we read also:—John Bon, *stone-cutter*, of the quarter of S. Marzial, and my son Bartholomew (Lorenzi, *Monumenti per la Storia del Palazzo ducale*, p. 68, from the College of the *Provveditori del Sal*, vol. III., 1411-1520).

Prima la faza de la chaxa la soa largheza che sora chanal grando da lun chavo a laltro e voltar i chantoni pie X. per chadaun canton verso le chale.[3]

The work includes all the length of the façade on the Grand Canal and ten feet on the sides at each end toward the *calle*.

(3). *Chale, calle*, or streets. The Ca' d'Oro, as we may see from a plan of Venice attributed to Albert Dürer, formerly had a *calle* at the west as much as at the east.

E prima voio far a i chantoni de la dita chaxa I° *lido*[4] *per chadauno el qual lido sia lavorado a foiame he che i chantoni sia chadaun dessi sia largi che i serva de lavorier de soto de i chantoni chomo se prenzipiadi i diti chantoni.*

First, I will make at each angle of the house a capital with foliage, standing on the rope moulding already on the corners of the palace.

(4). *Lido, i.e.* capital. There is no word in modern Venetian signifying this, but it can be seen from the context what was meant.

E la largeza de sovra sia chon sua raxon che la stia ben[5] *e chon la sua tola che liga la chornixe vechia*[6] *che voio meter ché* (ve o) *mostrado a quela vovra che chadaun de i chantoni geta fuora del dreto del muro la tola de i lidi de i diti chantoni pe uno e mezo.*

They will expand above in proportion to look well, and with the abacus binding with the old cornice, which I shall put up. The abacus shall project from the wall one foot and a half.

(5). "Look well." Aristotle registers in his *Rhetoric* (iii., 16) the answer the Greek gave to his baker. "Shall I knead your bread hard or soft?" asks the man. "Can you "not knead it well?" was the reply. The excellence of public works in Greece greatly depended upon the honesty of the contractors.

(6). The small Lombardic cornice which projects over the rosettes may be considered as the base of the crowning cornice.

E die meter my la mia chornixe vechia e sel bexognasse chonzar alguna chossa de la dita chornixe hover che el ge manchase el dito maistro sia tegnudo de conzar e compir.[7]

And he must apply my old cornice, and if it needs any repairs Master Bon is obliged to make them and to complete it.

(7). So the old cornice having been prepared, the new work begins.

E pluy die far i archeti i bexognera in la dita faza in questo muodo prima i bechadeli[8] *bexognera sia lavoradi chome se el desegno*[9] *e die esser a muro pien e die gitar fuora dela mia chornixe vechia per mezo e do adeda.*[10]

He must make the arches in this way: first the brackets according to the drawing, running through the thickness of the wall and projecting from the old cornice two inches.

(8). *Bechadeli, i.e.* brackets. Some of them project even now from the wall.

(9). "According to the drawing." Neither this, nor any other of the contemporary drawings, which served as architectural designs, have come down to us. In the contract for the Porta della Carta (l.c.) there are also mentioned: "*Among the foliage upon the "crowning arch, there will be naked children, as shown in the drawing.*" They also drew details: "*St. Mark in the form of a lion, according to the drawing which we have done and "have resigned into your hands.*"

(10). *Adeda, i.e.* fingers (inches?).

Intendando che i archeti sia lavoradi chome par per lo desegno e vol eser pie do in luxe per chadaun e vol levar intro el terzo el quarto e si vol sporzer fuora da i diti bechedeli quarte tre de pe da ladi de sovra voltando a muodo de meza veta[11] *e si vuol intrar pe uno in suxo el muro intendando che i diti archeti sia*

The arches shall be worked as in the drawing, two feet wide, high one-third or one-fourth more, and projecting at the top three-quarters of a foot from the brackets, curving outward elliptically, penetrating into the wall one foot. They shall be in two or three pieces each one and not more.

de pezi do in tre luno e non plui i qual archeti vuol eser sovazadi chomo apar in sul desegno e vol eser i diti archeti largi pe mezo in la faza davanti suxo i bechadeli, e intendando che i bechadeli sia uno dedo grosso plui largy per hogni faza che non se grosso[11a] *el pe delarcheto e chussi voio i archeti e bechadeli lavoradi verso le chale chomo se la faza davanti.*

Their mouldings, as in the drawing, shall be half a foot wide at the base on the brackets; these brackets projecting one inch beyond the base of the arch. So are to be worked the arches and brackets towards the *calle*.

(11). *Meza veta, i.e.* elliptic curve. A term still in use, denoting the graphic manner of tracing a segment of an ellipse by the crossing of lines drawn from the sides of a parallelogram.

(11*a*). *Dedo grosso, i.e.* pollice or thumb, a synonym of *inch*, still used.

Intendando che mezo archeto vegna per ladi a i chantoni e suxo i diti chantoni voio uno lion[12] *sentado chon la mia arma in le zafe tanto grando quanto el pora vegnir in li diti archeti.*

At each side of the angles will be half an arch, and on the corners I want a sitting lion holding my shield in his paws, as large as may be contained in the arches.

(12). One of these lions remains, but it has been placed higher, on a level with the battlements. These lions were almost a repetitition of those still existing at the angles of the cornice of the second floor. They were to be very large, but depending upon the size of the arches, so that they might not spoil the rhythm of the building itself, and yet that the shield of its owner might be very prominent.

E intendando che de sovra i diti archeti voio che sia una man[13] *de piere da uno chavo alaltro chon el voltar de le chale la qual sia grossa quarte tre de pe e larga a muro pien e che le geta fuora del muro pe uno e mezo he vol eser lavorade chon una fasia*[14] *chomo se la mia chornixe rossa dela mia faza che xe messa in el soler de sora*[15] *la qual fasia vuol eser grossa pe mezo e in le dite piere sora la fasia vuol esser* 1[a] *dentada che sia grossa una quarta de pe.*

Upon the arches I want a layer of cornice all along the façade and at the sides, three-fourths of a foot thick, wide as the wall plus a projection of a foot and a half, chiselled with a spiral ribbon, as the red stone cornice of the second floor of the same façade. This scroll will be half a foot thick, and above it, in the same stone, will be a dentil one-fourth of a foot thick.

(13). *Man, i.e.* hand (layer), a term yet in use among workmen.

(14). *Fasia i.e.* (stripe or ribbon) distinguished from *faza* (façade), meaning the rope moulding which, in the decadence of mediæval architecture, went on elaborating itself and displaying dexterous chiselling. In its simplest form it is a ribbon wound obliquely around a cylinder, whence comes its name, "*faza*," *i.e.* a band.

(15). *Soler de sora, i.e.* floor above. The red stone cornice still exists; it is varied by frequent changes in direction of the twist of the ribbon at the projecting sills of the balconies.

E voio una man de merli che vada in suxo la dita dentada e sia messi in suxo el dreto del muro e vol esser merli 64,[16] *intendando chel vol eser lamitade che se* 32 *vuol eser la sua longeza de sora da la piedega pie* 5 *e la soa largeza pe uno e mezo e qualchoseta plui e i merli pizoli vuol eser longi pie* 3 *de sora dala piedega e largi pie uno e qualchoseta pluj chomo i se partira aponto a la largeza de la dita chasa chon el volzer de i chantoni verso le chale pie diexe per chadaun chanton e vuol eser tuti i diti merli lavoradi chome par per lo desegno intendando che chadauno sia de un pezo.*[17]

And I want the battlements upon the cornice, over the wall, flush with the ashlar line; they shall be sixty-four; half to be five feet high and one foot and half a foot wide, or some little thing more, and the small battlements three feet high and one foot wide, or some little thing more, distributed along the façade and ten feet on each side, worked as in the drawing, and each one of one piece.

(16). The small battlements, being alternately placed, could be only thirty-one in number if the others were thirty-two. At each angle was a long battlement placed obliquely, and it is also probable that the crown finished with one of these at the sides.

The large battlements on the Canal side were twenty-six. In order to reach the number thirty-two mentioned in the contract, each side must have had three.

(17). "In one piece." This was important in order to prevent their falling down in case of storms, an accident which might easily happen with stones so tall and thin. The heavier battlements of the Ducal Palace are formed of three blocks, but the pinnacles between them are monoliths. The marks and letters engraved on the battlements of the Ca' d'Oro (somewhat enlarged in the drawing) are not the signs of the stone-cutters, but only guiding marks [Illustn. iv.], a simple and ancient device as old as Xenophon (Cyropedia, II., i.):—"Stones and timber, though heaped confusedly, may "be easily arranged and joined together if they bear marks designating their future "position."

E fazando in la dita merladura tre chorone[18] *zoe una per chanto e laltra in mezo e che le dite tre chorone sia tanto pluy longe de i diti merli chome lapar insuxo el desegno per raxon intendando che la groseza de la dita merladura vuol eser dela groseza dele bone man grosse dele gorne e si vuol aver per chadauno merlo balote tre de piera rossa fregade e lustrade per muodo che le para in suo cholor.*[19]

In the same battlements shall be executed three crowns, one at each corner and the other in the middle, higher than the battlements, as in the drawing, and in proportion. The battlements shall be as thick as the .... of the gutter. Each battlement shall have three balls of red stone, rubbed and polished so that they show their colour.

(18). The battlements in the centre of the façade, and the corner ones, are higher than the others; thus giving a certain undulatory appearance to the whole. It is also worthy of notice that the higher battlements were displaced from the axis of the window which marks the centre of the façade, in order to balance the composition and the apparent weight, drawing it away from the part of the façade perforated by loggias.

(19). The rubbing, followed by polishing, reminds us of the careful methods of preparing the marbles in the Middle Ages, to enhance their colour. The contract for the Porta della Carta (l.c.) reads; "All the above-mentioned work shall be rubbed and then "polished with pumice-stone, and joined in such way that it will look well." We find balls of red Broccatello in the tracery of the Ducal Palace. Those of the Ca' d'Oro are, however, of Istrian stone. The difference between the contract and the execution will be explained by the second document.

E tuto el dito lavorier vuol eser lavorado una volta ben da grosso el dito mistro sia tegnudo de darme una man de gorne schiete[20] *le qual sia el suo chavado largo un pe e chon i suoi mudioni e vuol eser tante quanto se el dito lavorier e de chavar piedege e arpexi e zioli e piombar a tute suo spexe e meter in nuovra el dito lavorier de maistranza de taia piera.*

The above-mentioned work shall be executed by the said master, who obliges himself to give me a plain gutter, with the hollow a foot wide, and the necessary brackets for the quantity of the above-named work; and must cut out for iron ties and cramps, and seal with lead at his own expense. And he must put in place all the above-named work so far as belongs to the workmanship of a stone-cutter.

(20). *Schiete, i.e.* plain. This gutter served to collect the water at the back of the battlements.

Io bortolamio fio de Mistro Zanebon schrissi de mia man propria de volonta del dito mio padre i pati sovra schriti e die aver mio pare Mistro Zaune bon del dito lavorier dal dito miser marin de miser antuonio el precholator ducanti duxento e diexe doro.

I, Bartholomew, son of Master John Bon, wrote by my own hand, at the will of my father, the above-named stipulations, and my father is to have, from Ser Marin, of Ser Antonio, the Procurator, the sum of 210 golden ducats.

Let us now study the document relating to the colour decoration of the cornice and of other parts of the façade.

MCCCCXXXI adi XV Setembrio.[21] September 15th 1431.

Questo sie el lavor chè vuol far far Miser Marin contarini de miser Autuonio el procurador de Pentura in la soa faza de la soa caxa da s. sofia sora canal grando.

Work of painting, for Ser Marino Contarini, in the front of his house at S. Sophia on the Grand Canal.

(21). Nearly a year and a half after the date of the contract for the construction of the cornice.

E prima dorar tute le pome[22] *che se suso i merli e dorar tuti i tondi de i merli che se soto i fiori. E dorar le ruoxe che se a i pie di archeti.*

First, gilding of all the balls of the battlements, and of the torus moulding which is under the flowers, and of the roses at the foot of the arches.

(22). *Pome, i.e.* apples or balls. The contract with Master Bon was for balls of red stone polished (see paragraph 19). The idea of gilding them, which occurred afterwards, explains why they were made of Istrian stone. The gilding of these balls, of the torus, and of the rosettes, gives at once an idea of the distribution of the gold, and of the resulting effect.

E dorar tute le foie de i do lidi grandi de i chantoni che i lioni va suso. E champizar el campo de i diti lidi de azuro oltra marin fin.[23]

Gilding of the foliage of the two large capitals at the angles bearing the lions, and colouring of the plain field of the capitals with fine azure ultramarine.

(23). "Azure ultramarine is a colour, noble, beautiful, and most perfect of all the "colours, and of that colour, together with gold, which makes blossom each work of our art, "either on the wall or the painted panel, everything is resplendent." (Cennino Cennini, *Trattato della pittura,* ch. 62, of the preparation of ultramarine.) We know from the same Cennini, that in the year 1400, indigo was also used, and German blue mixed with white lead. Of the nature of ultramarine we will speak again when the document specifies its quality.

E per lo simel dorar do lioni i qual va suso i diti lidi con le arme che i tien in le zafe le qual arme vuol aver azuro oltra marin.[24]

Also for gilding the two lions placed upon the capitals, together with the shields they hold in their paws, which shields shall also be ultramarine.

(24). Shield of the Contarini, bearing three azure bands on a gold field.

E la tavola dove possa i diti lioni vuol esser tuta la faza dorada E de soto vuol esser dazuro oltra marin fin con stellete doro[25] *intendando chel non die esser dorado dela dita soaza se no tanto quanto tien lo lido atorno.*

And the abacus on which stand the lions shall be gilt in front, with its soffit coloured with fine azure ultramarine with small golden stars; and be it understood that of the moulding only that part be gilt which surrounds the capitals.

(25). The golden stars were to give variety to the surface of azure when it became too wide. The builders of the Ducal Palace adopted the same expedient, as may be seen on the large mouldings of the second window on the wall-veil towards the Piazzetta, where the azure field is sprinkled with ornaments and foliage of gold.[14]

E per lo simel vuol esser dorado i ducati[26] *de la fasia de archeti.*

And also shall be gilded the ducats of the rope-moulding.

(26). *Ducati, i.e.* coins. This refers to the small discs which decorate the spiral band of the rope-moulding. They represent the coins, which in the Middle Ages ornamented the girdles and ribbons of the female dress; an example of this may be seen on the seventh capital, on the Piazzetta side of the Ducal Palace, counting from the fig-tree angle, where is represented a Venetian bride of the fourteenth century.

Apreso vuol esser dora tondi[27] *vinti con le so pome e fiori do de...* (desse?) *tuti doradi.*

Gilding of twenty discs with their balls, and of (twelve?) flowers, all gilt.

[14] See my pamphlet, *Sul colore dei monumenti.* Venezia, 1883.—G. B.

(27). The rope-mouldings are meant which surround the slabs of porphyry, *verde antico*, etc., and the balls of stone, pinned in the centre of each one.

Apreso vuol dorar larma granda[28] *zoe tuta la marcha con la dentada e foie e vuol aver le tresse dazuro oltra marin fin ben dopiado*[29] *per muodo che i la stia benisimo e questo sie tuto lo lavor che vuol far doro in la dita faza.*

Gilding of the large shield, that is to say the mask, with the dentils and the foliages, and painting the bands with fine azure ultramarine in such manner as it may stay perfectly. And this is all the work of gilding of the above-named façade.

(28). The shield is half way up the second floor, placed nearly in the centre of the façade.

(29). The colour being applied twice, that it might last the longer. Note the emphatic specification.

Apresso vuol che tuta la corona con i archeti e con le chuete che sera datorno i diti archeti e la chornisse che possa i diti archeti suso sia tuto dado de biacha a oio[30] *e che tuti i merli sia ombrizadi a muodo de marmoro*[31] *e cum qualche segno negro atorno i ori de i diti merli se lo i parera.*[32]

Then, painting in white lead and oil of all the crowning cornice, with the arches and cusps, and the cornice on which they are placed, veining the battlements to make them look like marble, with some black mark about their edge if it looks proper.

(30). *Biacha a oio, i.e.* white lead with oil. This part of the façade to be coloured was of Istrian stone, and the Venetians liked to blot out with a coat of white paint the bluish or yellowish tone of the original stone. There is frequently found in the stone-work of the fifteenth century a darkened skin, the remnant of the original coat of colour.

(31). *Ombrizadi a muodo de marmoro, i.e.* "shaded or veined like marble." In the buildings of the Byzantine period, the battlements and façade were coated with Greek marble, particularly that veined diagonally with grey-bluish undulations, of the Proconnesian quarries; but, when the marble was wanting, the mediævals of the decadence were reduced to imitation of the effect, in order that it might not remain inferior, at least in appearance, to the true richness of the buildings of the previous age.

(32). The battlements of the Ducal Palace have a moulded edge, which lightens their mass; those of the Ca' d'Oro are plain, and, so far as surface is concerned, they remain insipid,—therefore a border was simulated with a black line.

E per lo simel vuol esser tochado de negro el campo de le chuete[33] *va entro i archeti.*

Also shall be touched with black the field of the cusps in the interior of the arches.

(33). *Chuete, i.e.* "small tails" (cusps). These cusps, which in the windows of the lower floors are pierced, are only traced in the arches of the crowning cornice. By blackening their field, therefore, the effect of penetration was obtained.

Apresso vuol che tute le piere rosse che se in la dita fazada e tute le dentade rosse sia onte de oio e de vernixe con color che le para rosse.[34]

All the red stones of the façade, and the red dentils, shall be painted with oil and varnish, with colour, so that they look red.

(34). The cornice of the second floor, many of the framing dentils, some small columns and tablets of the façade, are of red Verona *Broccatello*, a marble composed of detritus of ammonites, more or less coloured. In order to intensify the effect of the red stones they were smeared with red paint. The wall-veil of the Ducal Palace, covered with slabs of white Istrian stone and red Verona marble, shows also traces of red colour applied with a brush. I have no proof that the Istrian stone was also covered with white lead, but that is possible. The façade of the Palace now appears after five centuries of life; but the artist of the fourteenth century felt the discord of the new

tablets, and he preferred to give them the same colour-value until Nature should in time do her own work.

Apresso vuol che tute le ruosse e vide[35] *che se entro la dita fazada sia tute dade de biacha a oio e penzer i campi de negro a oio per muodo chel stia ben.*

All the roses and vines of the façade shall be painted with white lead and oil, and their fields shall be painted black, so that they look well.

(35). The Byzantine friezes are here referred to, decorated with vine branches. At this point the artificial colouring reached its most garish stage.

E per lo simel vuol esser impechado[36] *i campi de tute le foie de la cornisse del primo soler tute con el voltar de i cantoni e con quatro piane che se in la calle de negro a oio.*

Shall also be tarred, with black colour and oil, the field of all the foliage of the cornice of the ground-floor, with the side angles and four sills towards the *calle*.

(36). *Impechado, i.e.* "tarred," perhaps because the black colour was bituminous, or because the method of caulking boats had given the name to all black colouring. The cornice here named is decorated with a double range of leaves, which follow the outline of its moulding.

El qual tuto lavorier die far maistro Zuan de franza pentor da santa ponal a tute suo spexe intendando chel dito maistro die meter azuro oltre marin de priexio de ducati XVIII la lira,[37] *e die aver per so fatura del dito lavor a tute suo spexe ducati 60 doro. Mi Franzesco fio del dito maistro Zuane de franza de volunta soa o scrito i diti pati.*

All this work shall be done by Master John of France, painter of S. Apollinaris, at his own expense. And he shall use azure ultramarine costing 18 ducats a pound. He shall have for his work 60 golden ducats. I, Francis, son of the said John of France, wrote these stipulations.

(37). The Venetian ducat, between the years 1429 and 1443, was equal to 5·4 lire. The lira being 2·31 francs, every ducat was equal to 12·03 francs, and a pound of azure ultramarine cost 216·54 francs. According to Cennini it cost eight ducats an ounce, and calculating the silver ducat, this corresponds with the above-named price.

By azure ultramarine is meant the powder of *lapis-lazuli*, to the grinding and selecting of which Cennino Cennini has devoted an entire chapter of his work already quoted. *Lapis-lazuli* was obtained in the Middle Ages from the mountains of Badakshan, in the great Bokhara, the Asiatic province situated east of Persia. There in the tenth century was born Avicenna, who meditated upon the works of Hypocrates and Galen, and became the most learned physician of the Middle Ages. In his book, *de Arte Chimica* (Basileæ, MDLXXII, p. 484), he describes the preparation of *lapis-lazuli* for medicinal purposes, and in the *liber Canonis* (Venetiis, MDLXXXII, p. 564) he attributes to it the comforting properties of the *lapis armenus*, which was supposed to purge the body of melancholy humours. On the ancient earthen vases of the Venetian apothecaries is written RVBINI. ZAFFIRI. SMERALDI *preparati*, and also LAPIS-LAZULI.[15] It was used as an amulet, to prevent the spasms of children, and for preserving the eye-lashes; its adulteration was looked on as a crime. *Graviter puniendi essent illi medicamentarii, qui in his componendis, loco lapidis lazuli Cæruleo facticio utuntur* (*Aldovrandi, Musæum metallicum*, Bononiæ, 1648, p. 351). Cf. Olao Worm, *Museum* Amstelodami CIↃIↃCLV. p. 65, and Silvatici. *Pandect, medicinæ*, Lugduni MDXLI.

The first to note the existence of layers of *lapis-lazuli* in Asia was Marco Polo, calling it the most beautiful in the world and saying that it was found in veins like silver:

[15] See my pamphlet, *Un antica farmacia Veneziana*, 1884.—G. B.

"*Encore ai en ceste meisme contree* (*Balacian, i.e. Badakchan*) *une autre montaigne, ou on* "*trueve lasur, et est li plus fins dou monde et le trueve ou en une vaine si come l'argent.*" (MSS. of the fourteenth century, in the R. Library of Stockholm.)

According to Scheffer (*de arte pingendi.* Norimbergæ 1669, p. 168) *lapis-lazuli* was called ultramarine, because it came from the island of Cyprus. Dioscorides himself (*de medic.* v. LX.) and Oribasius, the physician of Julian the Apostate (*collect. medic.* Venetiis *Manutii,* p. 511) had also asserted that a κυανός (azure) was found in the copper mines at Cyprus, and Sir John Hill affirmed that it received the colour from that metal (*English version of Theophrastus.* London 1774). But it was not to a salt of copper, nor any other azure earth, that the name of ultramarine was given, but to the powder of the azure diasper (and here I accept the nomenclature of Pliny, H.N. xxxvii, 38), because it was necessary to go to the coast of Arabia, where it was brought by caravans from the Persian Gulf,— or "because it surpassed in intensity the colour of sea water" (Mercati, *Metallotheca,* Romæ, MDCCXIX, p. 70), and the name of ultramarine distinguished it from the blue of Germany.

We have adopted the Arabic denomination of *lapis-lazuli,* abandoning entirely the others. "*A Græcis* κυανός λίθος *a Latinis cærulens lapis,* ab Arabibus, hager aut azul unde nomen asuri aut lazuli deductum est appelatur. (Boetius de Boot, *Gemm. et lapid. Historia,* Lugd. Bat. CIↃIↃCXXXVI, p. 274.) The Byzantines at once availed themselves of the new name: *sic* λίθος λαζούριος *Graecis recentioribus in medicina dicitur* (Salmasii, *de Homonymis,* p. 217. cf. Du Fresne. Gloss: ΛΑΖΟΥΡΙΟΝ). It is the *lazavard* of Ibn Aucal, the *al-lazur* of Abulfeda (see Lazzari, Viaggi di Marco Polo, Venezia, 1847, p. 383). Ahmed Tiefash gives a description of the *lapis-lazuli* in the seventeenth chapter of his work on precious stones (Ravius, *Specimen Arabicum,* 1784, and the Italian translation with Arabic text, Florence, 1818).

Colonel Yule derives the name of lazuli from the name of the mines of Lajwurd (The book of Marco Polo, I. 270).

The *lapis-lazuli* block was admired for its combination of the most admired colours, as its deep azure seemed spangled with gold (crystals of copper pyrites): "*Cœli colore* "*intermicantibus aureis maculis. Inde e rei natura mira occasio artificio data dum* "*coelatur, aurum ornat vestes vel sidera refert* (Cardani, *de subtilitate.* Basileæ, 1553, p. 293). It was the image of a starry night: "*A Mesne lapis vocatur stellatus quoniam* "*aureis pulvisculis nonnusquam etiam punctis stellarum instar intermicare videatur, quam-* "*obrem à Myrepso lapis radians appellatur*" (Mercati, l.c., p. 70).

This stone being the only one of its colour which could be used for architectural ornamentation—indeed the only azure marble in existence—it was placed among the gems, where it was also intended to place all the blue stones that might be discovered in the future: "*Cærulei coloris lapides, non inter marmora* "*recensentur sed inter gemmas* " (Cesalpinus, *de metallicis,* II., xvii.). When, from the powder of *lapis-lazuli,* ultramarine was extracted, the need was felt for returning to it the golden colour it had lost in grinding; this combination of blue and gold being, as we noticed, the most precious, even to the poets of the Middle Ages. Cavalcanti named

gold and azure among the few things that were only surpassed by the beauty of his beloved:

Aria serena quand appar l'albore	The air serene at the break of day,
E bianca neve scender senza venti	And the falling of the white snow when the air is still;
Rivere d' acqua et prato d' ogni fiore	Rushing water and meadows bright with flowers,
Oro, argento, azzurro, in ornamenti.	And gold, silver, and azure in the decorations.

Let us now consider how much more in the polychromatic decorations of the Ca' d'Oro this combination must have been preferred by its proprietors, the Contarini, whose armorial colours were blue and gold.

In the accounts attached to the document are the memoranda for the acquisition of gold leaves. Their dimensions are uncertain; we only know that the gold leaves were prepared within squares of Greek parchment or paper, of the breadth of four fingers, rubbed with burnt ochre (Theophili, *diversarum artium schedula*, I., xxiii., Paris, 1843.) The traces of gilding, which I myself studied on the Ca' d'Oro, cannot be suspected from below, and he who passes and looks up does not think from whence came its name: "The House of Gold;" nor does he see any gold on the remains of the buildings of the most beautiful epoch of another civilization, when gold was still used "as a light necklace about the throat of a lovely and modest woman" (Lucian).

On the 10th of October 1836, during the excavations in the right aisle of the Propylea at Athens, was found a broken inscription, of the year 400 B.C., which records the expenses of the buildings of the Erechtheum. On one of its fragments is written as follows (the missing letters are added in small type):—

... : ΧΡΥΣ [*ος π*]	Gold, two petals (leaves or thin laminæ)
ΕΤΑΛΟΔΥΤΟΗΕΟΝΕΘΕΧΡΥΣΟ [*σαι*]	have been bought from Adonis, who lives at
ΤΟΗΟΦΘΑΛΜΟΤΟ ΚΙΟΝΟΣ ΠΑΡ'[Αδ]	Mileto, in order to gild the eyes (volutes) of
ΟΝΙΔΟΣΕΜΜΕΛΙΤΕΙΝΟΙΚΟ [*ντ*] Ο	the column . . . . . (drachmæ) 2
ΣΙΙ....	

Corpus Inscriptionum Atticarum, I. p. 171, v. 41

Among the memoranda of the contract for the polychromatic decorations of the Ca' d'Oro is the following note:

adi 30 *de zugno*	June 30th (1432).
I die contadi miser Marin a maistro Antuonio	Paid by Ser Marino to Master Antonio of
d Bortholomio per oro f. 100 *grandi per nome*	Bartholomew for one hundred large golden
de mio padre. . . . . . *duc.* 1	leaves, on account of my father . ducat 1

The Athenian inscription and the Venetian document are the best inscribed records we possess to prove that gold, the richest and most beautiful among temporary means for supplying a new building with colour, was alike used during the best periods of Grecian and of mediæval art.

GIACOMO BONI.

*** Illustn. iii is the reproduction (enlarged) of a photograph, made by Signor Boni's orders in Venice, of a mezzotint engraving executed at the beginning of the present century. Respecting it, he writes,—"In the print of which I send you the photograph you can even distinguish the original shape "of the ground-floor windows which were afterwards turned into two-light ones, with the addition of "an ugly balcony."

XXV.

SKETCHES IN SOUTH LINCOLNSHIRE.

By Mr. W. H. Bidlake, M.A.Cantab., *Pugin Travelling Student*, 1885.

[*Extracted from a Report addressed to the Council of the Royal Institute.*]

IN February 1885, I had the honour of being elected the Pugin Travelling Student for that year, when I chose as the district of my tour the South of Lincolnshire, with special reference to Lincoln and Peterborough, and the country immediately surrounding Newark, Leadenham, Sleaford, Boston, and Spalding. The collection of sketches and measured drawings made during my tour were duly deposited in the Library of the Royal Institute, and a few of these having been chosen for illustration in the Transactions, I beg leave to submit the following notes respecting them.

The quaint and much dilapidated little church of Rolleston, near to Newark, merits a visit on account of its carved capitals, one of which, as well as the south-east respond, is of the crocket type, and seems to be of French design, although not possessing the square *abaci* which usually characterize French work. The respond, which recalls to me a capital in the south transept of Westminster Abbey, has three classes of foliage, each excellently adapted to its position. The knob of each crocket is formed of a cluster of stiff ivy leaves, while the lower portion is ornamented by a wreath of more delicate leaves which grow from a slender twining stalk. On the wall at the side are flat leaves cut in low relief [see Illustn. next page].

The crocket capital is more conventional, and has two rows of ivy-leaf knobs, while its neighbour, which crowns a pier of four detached shafts, is, in the character of its sculpture, a nearer approximation to Early English, and has four heads peeping out between the full round foliage.

Such carving, however, is but a clumsy expression of the artist's idea compared with that of the Cathedral, not far distant. In the Angel Choir of Lincoln Cathedral is the very acme of Gothic sculpture. Restricted in the range of subject, yet endless in the diversity of its treatment, it will, in the grace of its lines and the delicacy of its execution, bear comparison even with the Greek, and indeed, to me, the almost illimitable variation



South-east Respond at Rolleston Church.[16]

of a simple type, which is to be found in the leaf clusters growing, as it were, spontaneously from every hollow moulding of the Angel Choir, is a higher art than the constant repetition of a once-perfected form which ornamented the Greek temple.

There is, none the less, a certain restraint in the carving of this treasure-house of Gothic art, and the capitals, for the most part, conform to one definite arrangement of parts. Each leaf-cluster consists of one central symmetrical leaf of five lobes, curved downwards, supported on either side by an asymmetrical leaf of three or more lobes,

[16] These illustrations inserted in the text are reproduced by a photographic process from pencil sketches.

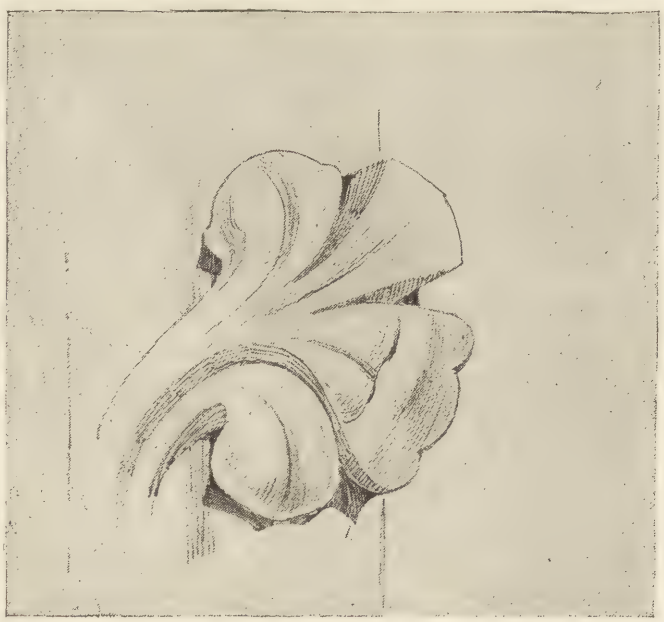
the outermost of which curls upwards, and these clusters are placed alternately at higher and lower levels round the bell of the cap. This is the usual type, the widest departure from which is to be seen in the wall arcading of the south aisle. In this instance the capital has a very rounded outline, and consists of six sprays whose leaves mutually interlace, and all touch the spherical surface. It is a marvel of stone undercutting.

Lincoln offers examples of art-work in other materials than stone, and the wrought iron gate at the top of the Greston Stairs may serve as an example [Illustn. vi]. Similar in design are the gates of the Hall at Fulbeck, a village about twelve miles distant, which possess a grotesque of strong family likeness to that of Lincoln, and are probably the work of the same hand.

Further south, and forming the centre of a rich architectural district, is Spalding. The parish church, the north porch of which is here illustrated, is of most irregular plan, and has passed through many vicissitudes [Illustns. vii, viii]. Originally there was an Early English cruciform building, the greater part of which still remains.



Foliage, Lincoln Cathedral.



Foliage, Lincoln Cathedral.



Capitals of the Wall Arcading, East end of the Angel Choir, Lincoln Cathedral.

It was not, however, sufficiently lofty to suit the 15th-century architect, and so he accordingly took down the clerestorey of the nave, removed the pier capitals, added some four feet to the piers, and then, after replacing the old capitals, rebuilt the Early English arches, adding a Perpendicular clerestorey and an open timber roof. A fragment of the string-course which once ran above the nave arcade, marking its original height, is to be seen in the south-west corner near the tower. The transepts have undergone little change, and have an interesting clerestorey of circular windows. These now show within the church, as the aisle roofs have been raised. The four piers at the crossing are stronger than, and of different plan to, those of the rest of the arcade, but are not so strong as to support a central tower. It has been suggested by the rector that the roofs of the four arms mitred at the crossing, and that the valley-beams rested on these piers.

The north porch is quite square on plan, and is covered by fan-tracery vaulting. The three central niches over the external arch have been converted into windows. Over the north doorway within the porch are also three niches. Neither in these,

however, nor in other parts, is the carving at all delicately cut, and it is so unlike the usual 15th-century English that it suggests the hand of an amateur who had an idea, but was at a loss how rightly to express it in stone.

The peculiarities are not restricted to the carving of the canopies, to the unfortunate creatures who have been squeezed into a triangular shape to serve as brackets, nor to the heads which form the label stops, and over which lizards are crawling; the profile of the mouldings is also unusual, the projecting members being composed almost exclusively of straight lines, and the curved being retained in the hollows. In fact, there is a leaven of angularity which pervades the whole design.

The head of the doorway is cut out of one stone, and is not even jointed in the centre, and the small side windows are jointed horizontally, quite regardless of the lines of tracery. Yet with all its eccentricities the porch is pleasing in design, and has a much greater freshness and originality than many in the neighbourhood. A porch very similar to it occurs at Pinchbeck, a village two miles distant, and is evidently the work of the same man, who must have also designed the fine western doorway of that church.

South Lincolnshire is rich in church architecture, and much of that which does not lie on the well-beaten track is but little known to the majority of students. Those who are intrepid enough to venture away from the railway line will be amply repaid by the discovery of many beautiful village churches, which, while being excellent specimens of the Decorated style in particular, will be found also to possess a still wider interest, and afford materials for a more extensive study.

W. H. BIDLAKE.

XXVI.

SKETCHES IN ITALY AND FRANCE.

By Arnold B. Mitchell, *Associate, Soane Medallist*, 1885.

[*Extracted from a Report addressed to the Council of the Royal Institute.*]

Steel Sword Hilt from the Bargello, Florence.—The sword from the Bargello Museum at Florence is a fine piece of Renaissance metal work, though as a weapon useless, owing to the elaborate workmanship of the hilt, which it would be impossible to grasp with sufficient firmness [Illustn. ix]. Doubtless it was merely intended for dress purposes, and as such forms a very beautiful object, though contrary to all accepted theories of design.

Bronze Standard-pole Rest from Siena.—This work presents a striking contrast, utility being unmistakeably the principal end aimed at; and this has been accomplished in so natural a manner, and with an addition of artistic enrichment, which makes it most pleasing. As will be seen in the upper portion, there is a circular opening through which the standard-pole was placed, the base of the pole resting in the socket prepared for it; these bearers are fixed along the front of the Palazzo Magnifico at about six feet in height from the ground, and the ring below is supposed to have been used as a means of attaching chains from one side of the street to the other, in order to prevent cavalry from charging [Illustn. x].

The Lantern Tower of St. Ouen, Rouen.—It may be interesting with regard to the central tower of St. Ouen, at Rouen—generally considered one of the most beautiful erections of its time—to note one or two of Mr. Ruskin's remarks concerning it; and it is not impossible that more truth may be discovered in them than will at first be acknowledged. In the *Seven Lamps of Architecture,* whilst referring to flying buttresses and pinnacles, and directing attention to the Choir of Beauvais as a masterpiece, Mr. Ruskin goes on to say:[17]—"In later Gothic the pinnacle became gradually a decorative "member, and was used in all places merely for the sake of its beauty. There is no "objection to this; it is just as lawful to build a pinnacle for its beauty as a tower; but "also the *buttress* became a decorative member, and was used, first where it was not "wanted, and, secondly, in forms in which it could be of no use, becoming a mere tie,

[17] *Seven Lamps*, 2nd Edition, page 35.

" not between the pier and wall, but between the wall and the top of the decorative " pinnacle, thus attaching itself to the very point where its thrust, if it made any, could " not be resisted. The most flagrant instance of this barbarism that I remember (though " it prevails partially in all the spires of the Netherlands) is the lantern of St. Ouen at " Rouen, where the pierced buttress, having an ogee curve, looks about as much calcu- " lated to bear a thrust as a switch of willow; and the pinnacles, huge and richly " decorated, have evidently no work to do whatsoever, but stand round the central " tower, like four idle servants, as they are—heraldic supporters, that central tower being " merely a hollow crown, which needs no more buttressing than a basket does. In fact, " I do not know anything more strange or unwise than the praise lavished upon this " lantern; it is one of the basest pieces of Gothic in Europe; its flamboyant traceries of " the last and most degraded forms, and its entire plan and decoration resembling and " deserving little more credit than the burnt sugar ornaments of elaborate confectionery." The drawing was taken from the extreme western end of the nave gutter on the north side of the church, after two unsuccessful attempts at a perspective view, owing to the difficulty of obtaining a good position [Illustn. xi.] The date of the erection of the tower is after the year 1490.

The West Front of Reims Cathedral.—The late Mr. Fergusson describes this front as the noblest structure produced during the Middle Ages, and it has also been said that in order to make a perfect cathedral the nave of Amiens must be united to the Choir of Beauvais, while to these must be added the south-west tower of Chartres and the façade of Reims. One point in the design of the front has struck me, namely, the way in which the towers form an integral part of the design, and do not appear in any way to be additions or appendages. This end seems to be achieved by the manner in which the buttresses to the aisles are treated. They are simple repetitions of the niches and pinnacles on the second stage of the towers; or rather, perhaps, the order should be reversed, and the tower pinnacles and niches may be called repetitions of those of the aisles; so that there is a continuous line of statued niches completely encircling the cathedral. This treatment has the effect of so tying the towers to the body of the church, that the design appears as one whole, affording one of the very few successful examples in this respect. The drawing from which the Illustration is taken occupied five days in execution, the point of view being the centre of the Rue-Sainte-Catherine, a street leading up in a direct line to the west front of the cathedral [Illustn. xii].

The Stalls, Amiens Cathedral.—The contract for these stalls was taken in the year 1508 by Arnold Boulin, master-joiner; the agreement specified for the construction of one hundred and twenty stalls, with historical subjects, high backings, crownings, and pyramidal canopies. The work was completed in 1522, thus taking fourteen years in execution, and the number of workmen employed was not more than eight, probably only six; the cost was, roughly speaking, four hundred pounds of our money. The workmanship is truly wonderful. Nearly the whole of the Old Testament stories are here illustrated, and with a variety and imagination which is astonishing [Illustns. xiii, xiv].

ARNOLD B. MITCHELL.

XXVII.

TWO PENCIL SKETCHES.

By Mr. George J. Oakeshott, *The Aldwinckle Travelling Student.*

As the successful candidate in the competition for the Travelling Studentship presented to the Royal Institute by Mr. Thomas W. Aldwinckle,[18] I made a two-months' tour in Italy, studying, sketching, and measuring the best examples of the Renaissance period (14th and 15th century) in Florence, Siena, Bologna, Orvieto, Brescia, Mantua, Cremona, and Genoa, and studying the many magnificent remains of the Classical period at Rome. Venice, Verona, and Milan were omitted from my programme, owing to threatened invasion of cholera in those towns, and also owing to the fact that I had already visited them last year.

The two Illustrations [Nos. xv and xvi], reproduced from pencil drawings, represent respectively the choir lectern at Siena Cathedral, and a *comunicatorio* by Mino da Fiesole, at Sta. Croce, Florence. The lectern was designed by Bartolommeo Neroni (generally known as Maestro Riccio), who in early life was a painter in oils and fresco, and who even erected one or two churches in Siena. In his later days, however, he was so infirm as to be confined to his chair, and he then made the sketches for the choir stalls, bishop's throne, the marble staircase to the Pisano pulpit, and this *leggio* or lectern, all in the Duomo of Siena. The actual carving of the latter was executed by two men, celebrated in their day but now almost forgotten, Benedetto, of Montepulciano, and Domenico di Filippo, of Florence, who finished it in 1573. The *comunicatorio* by Mino da Fiesole is one of the many graceful works of the celebrated sculptor, which are found in and around Florence, and, as is usual with that master's work, is in pure white marble, finished with extreme delicacy and refinement.

GEORGE J. OAKESHOTT.

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[18] This gentleman, now a Fellow, presented the sum of £50. for the promotion, during the year 1886, of the study of works of Classic Architecture and of Classical Renaissance Architecture in the Kingdom of Italy; and he limited the competition for this special Studentship to British subjects between the ages of 18 and 30 years. The award was made by the Council of the Royal Institute.

XXIV. THE CA'D'ORO AND ITS POLYCHROMATIC DECORATIONS (iii).



THE PHOTOTYPE Co., 303, STRAND, LONDON.

VIEW OF THE CA'D'ORO. From a Mezzotint Engraving, CIRCA, 1800.

[PAGE 36].

XXIV. THE CA'D'ORO AND ITS POLYCHROMATIC DECORATIONS (iv).



THE PHOTOTYPE Co., 308, STRAND, LONDON.

RESTORATION OF THE CORNICE AND BATTLEMENTS OF THE CA'D'ORO.
From a Drawing by G. BONI, HON. CORR. MEMBER.
[PAGE 27].

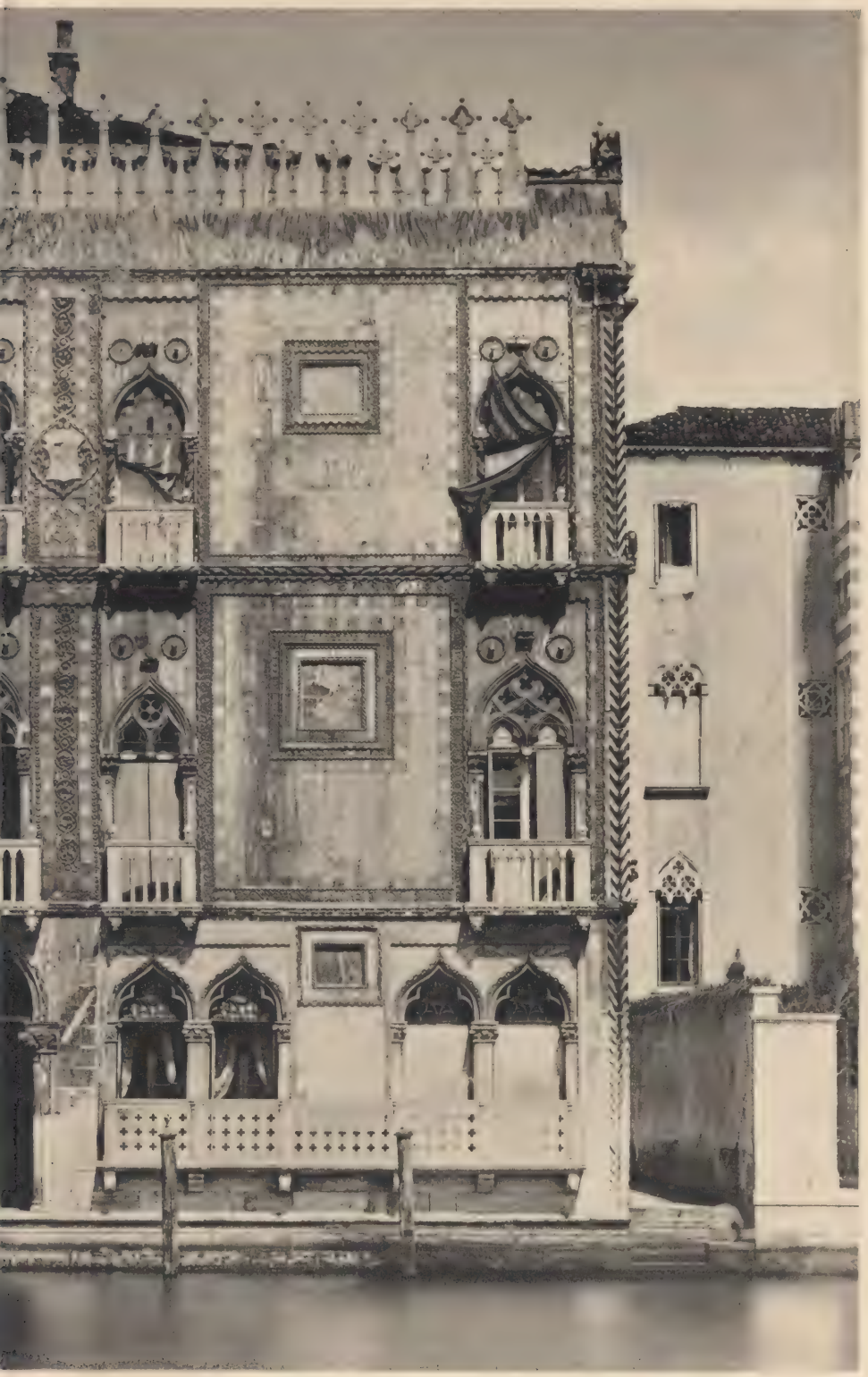
XXIV. THE CA'D'ORO AND ITS



VIEW OF THE CA'D'ORO, FROM A PHOTOGRAPH

[PAGE

LYCHROMATIC DECORATIONS (v).



THE PHOTOTYPE Co., 303, STRAND, LONDON.

ENTLY TAKEN FOR THE AUTHOR OF THE PAPER.

XXV. SKETCHES IN SOUTH LINCOLNSHIRE (vi).



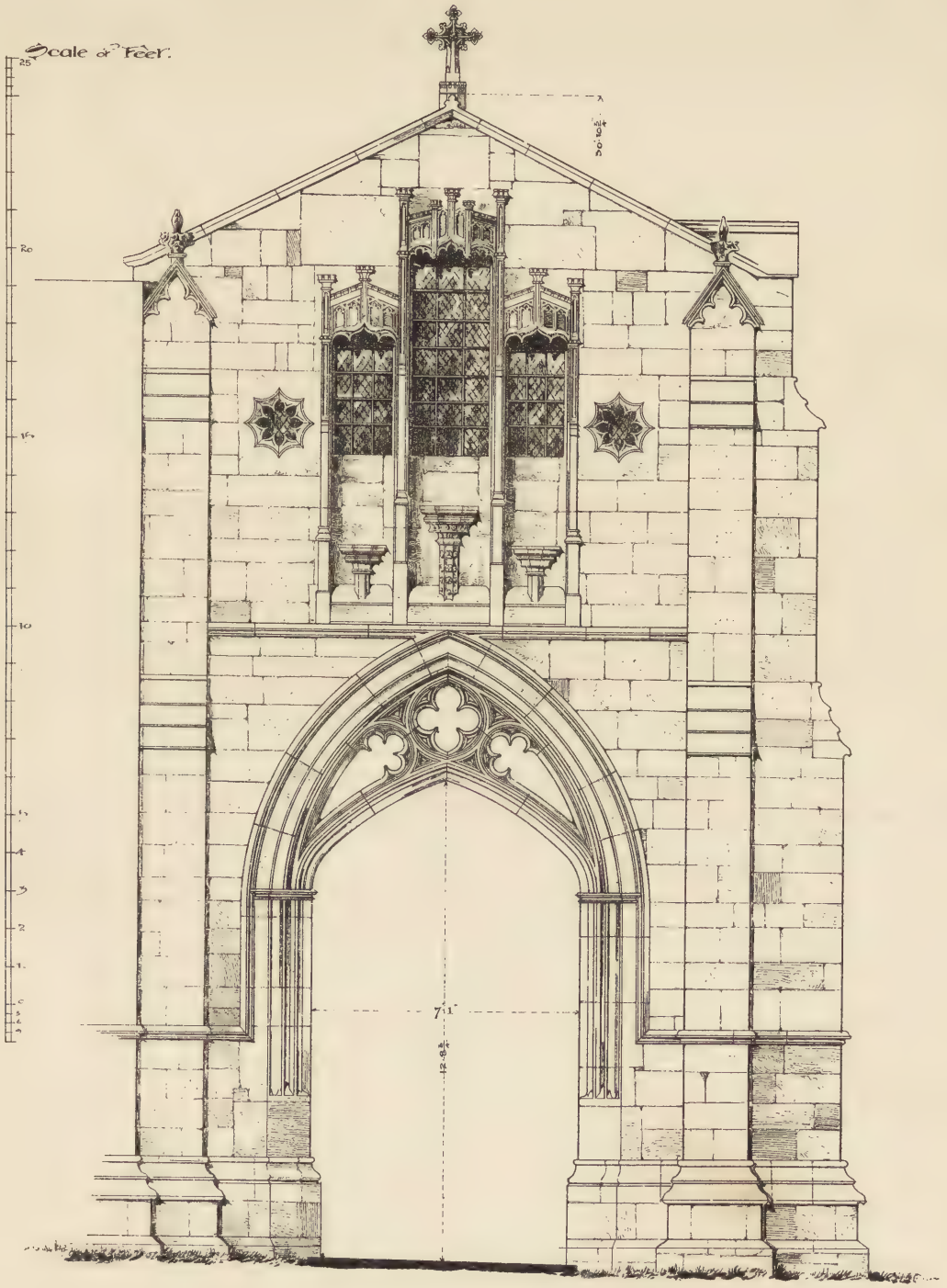
THE PHOTOTYPE Co. 303, STRAND, LONDON

W. H. BIDLAKE, DEL.

WROUGHT-IRON GATE AT LINCOLN.

[PAGE 39].

XXV. SKETCHES IN SOUTH LINCOLNSHIRE (vii).

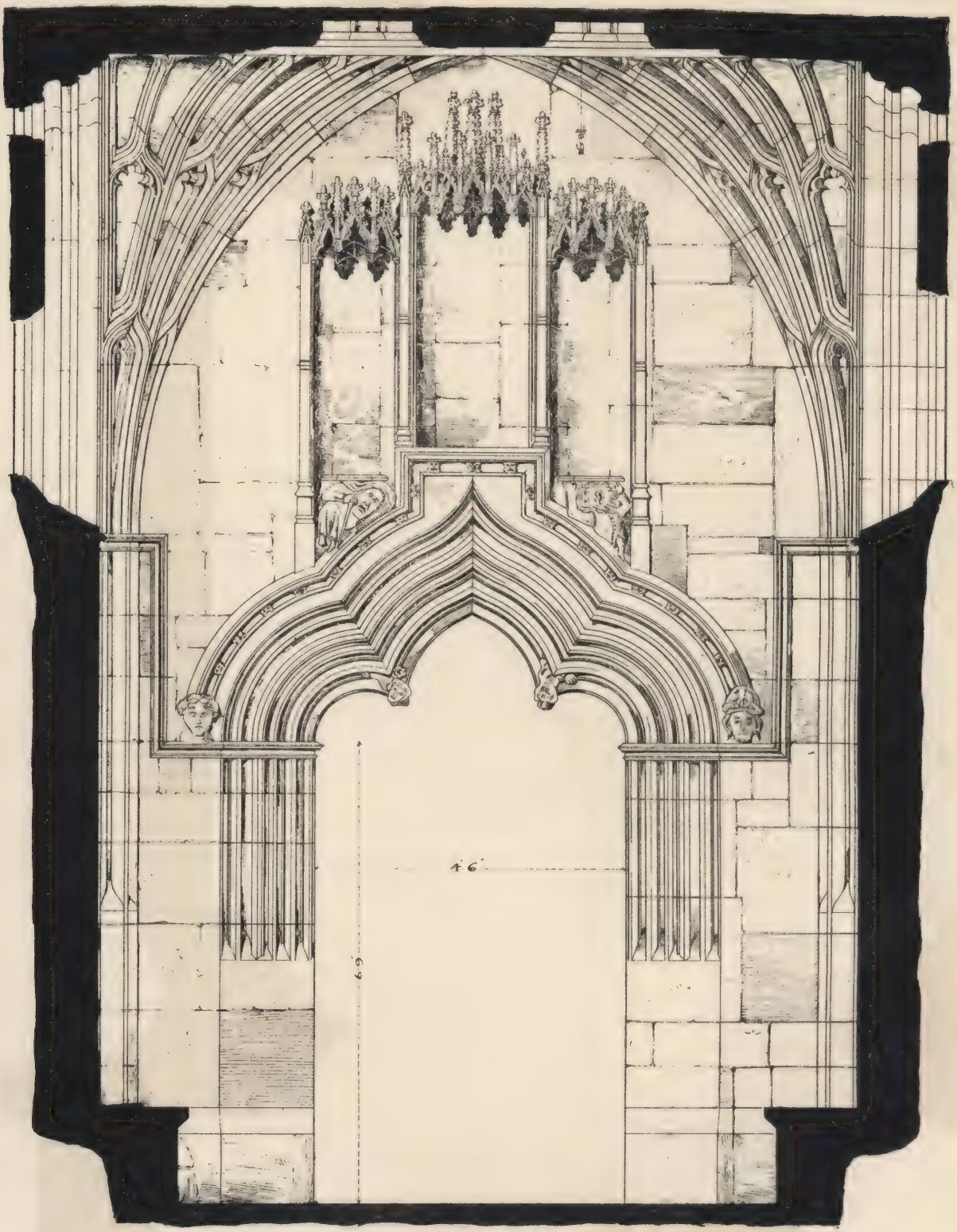


THE NORTH PORCH, SPALDING CHURCH.

W. H. Pridlake
Mens: et delt: July 1885

MEASURED AND DRAWN BY THE PUGIN TRAVELLING STUDENT, 1885.

(Page 39.)



SECTION THROUGH THE LINE A–B ON PLAN.

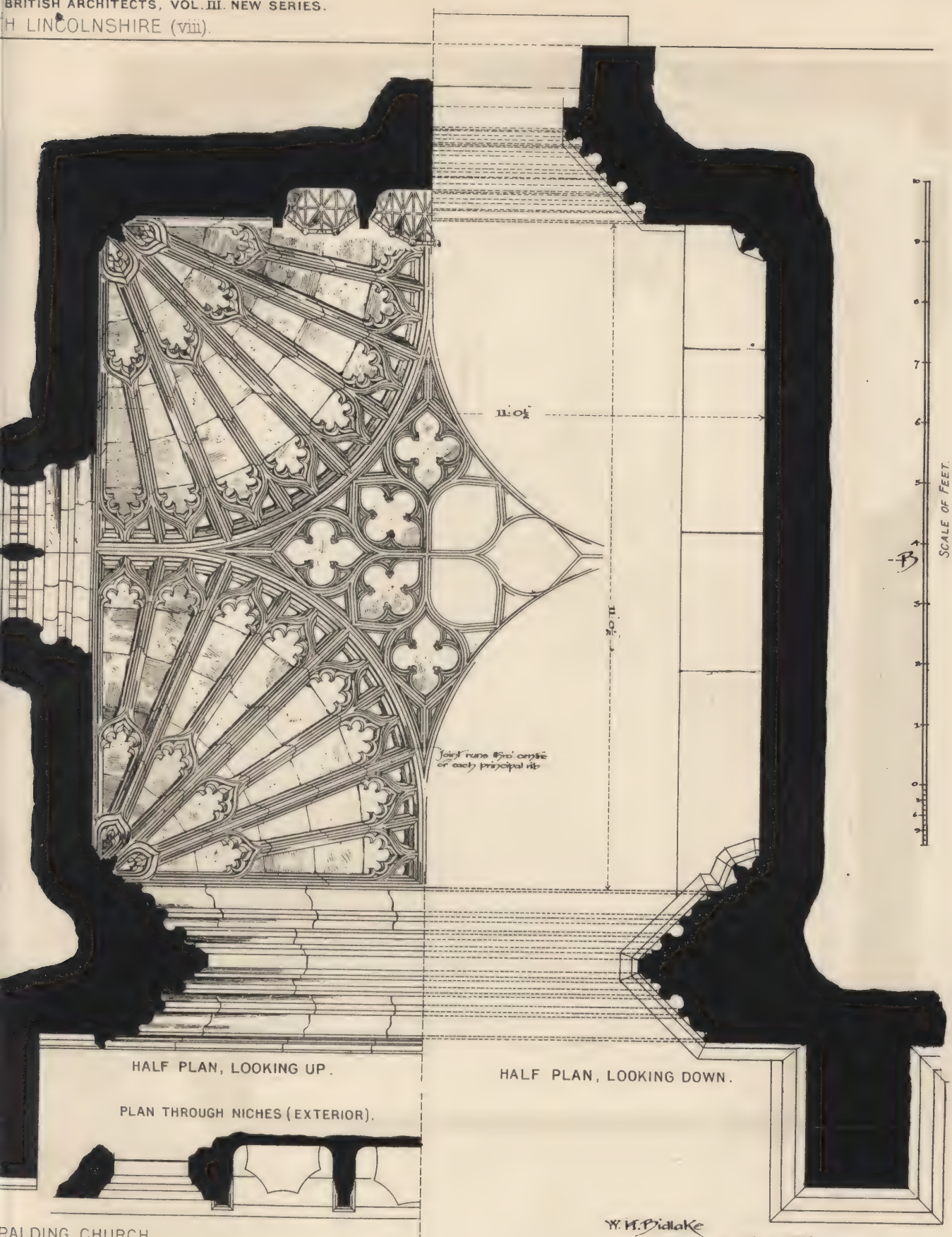
SCALE OF 12 9 6 3 0 1 2 3 4 5 6 7 8 9 10 FEET

{Page 39.}

THE NORTH PORCH,

MEASURED AND DRAWN BY THE

H LINCOLNSHIRE (viii).



HALF PLAN, LOOKING UP.

HALF PLAN, LOOKING DOWN.

PLAN THROUGH NICHES (EXTERIOR).

W. H. Bidlake
Measd & Delt. July 1885

PALDING CHURCH.

N TRAVELLING STUDENT, 1885.

XXVI. SKETCHES IN ITALY AND FRANCE. (ix).



THE PHOTOTYPE Co. 303, STRAND, LONDON.

STEEL SWORD HILT FROM THE BARGELLO, FLORENCE.

From a Drawing by ARNOLD B. MITCHELL, Soane Medallist, 1885.

[PAGE 42].

XXVI. SKETCHES IN ITALY AND FRANCE (x).



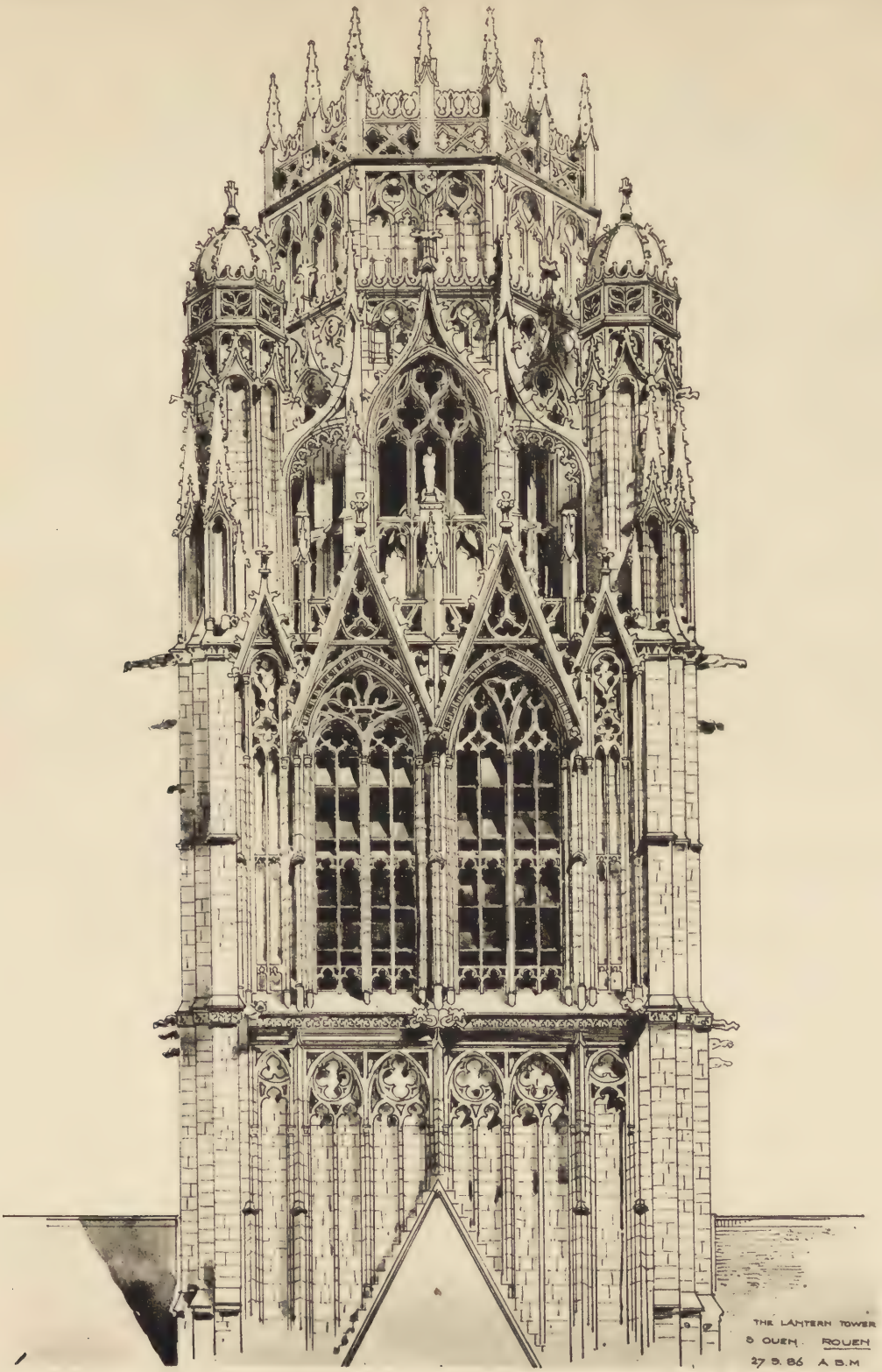
THE PHOTOTYPE Co., 808, STRAND, LONDON.

BRONZE STANDARD-POLE REST FROM SIENA.

From a Drawing by ARNOLD B. MITCHELL, SOANE MEDALLIST, 1885.

[PAGE 42].

XXVI. SKETCHES IN ITALY AND FRANCE. (xi).



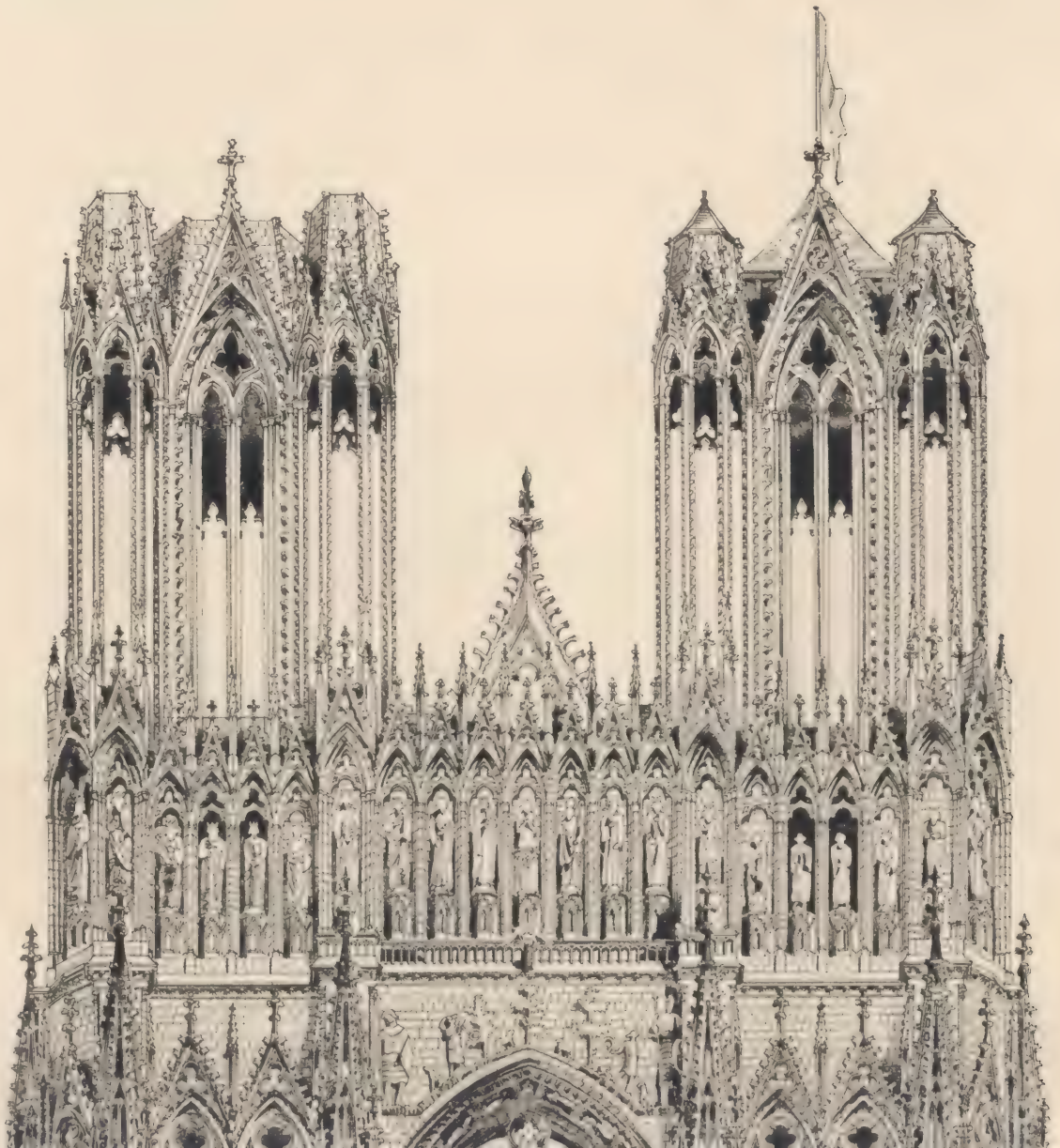
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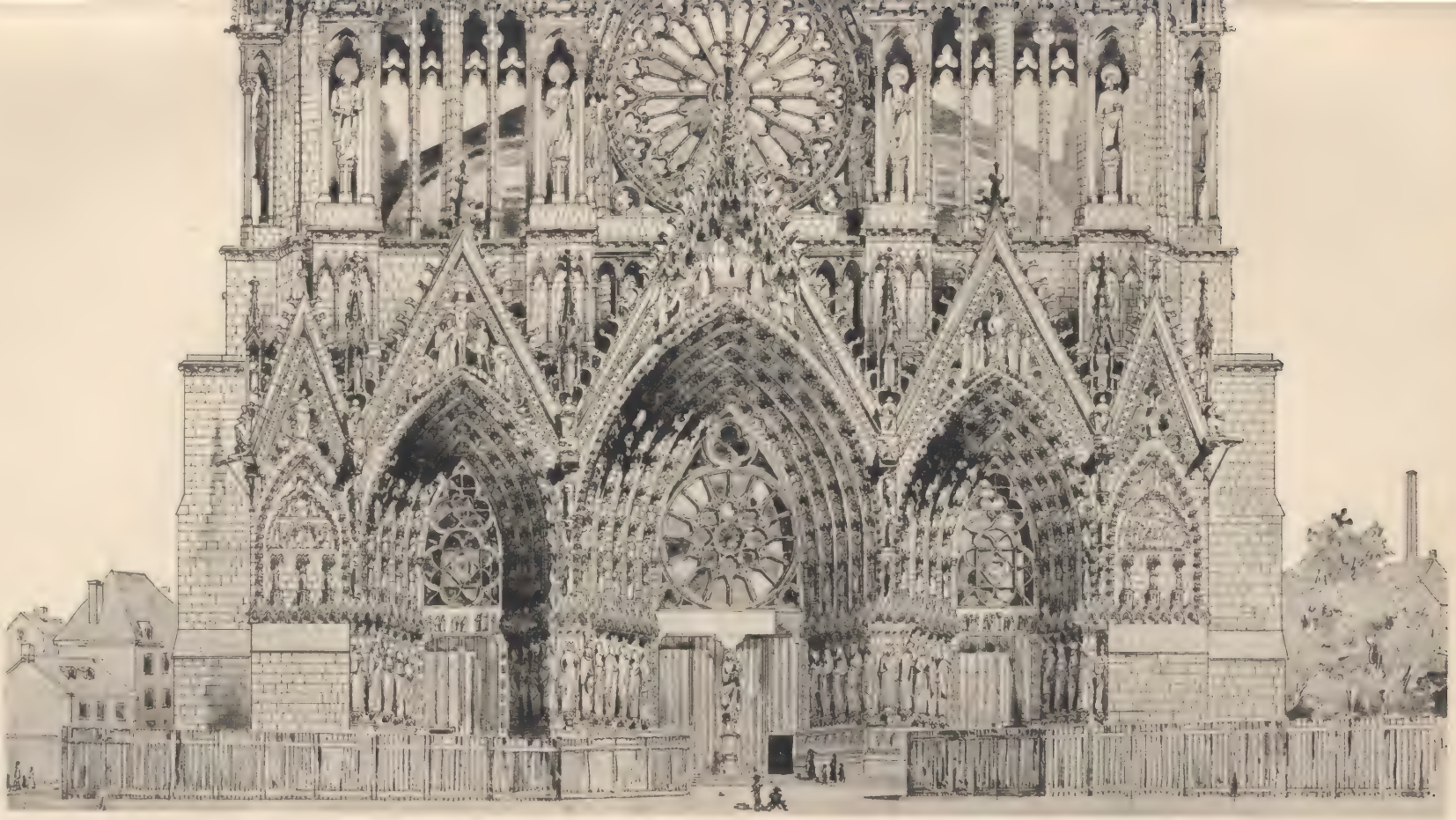
THE LANTERN OF ST. OUEN, ROUEN.

From a Drawing by ARNOLD B. MITCHELL, Soane Medallist, 1885.

[PAGE 43].

XXVI. SKETCHES IN ITALY AND FRANCE. (xii.).





THE PHOTOTYPE Co. 303, STRAND LONDON.

THE WEST FRONT OF REIMS CATHEDRAL.

From a Drawing by ARNOLD B. MITCHELL, Soane Medallist, 1885. [PAGE 43].



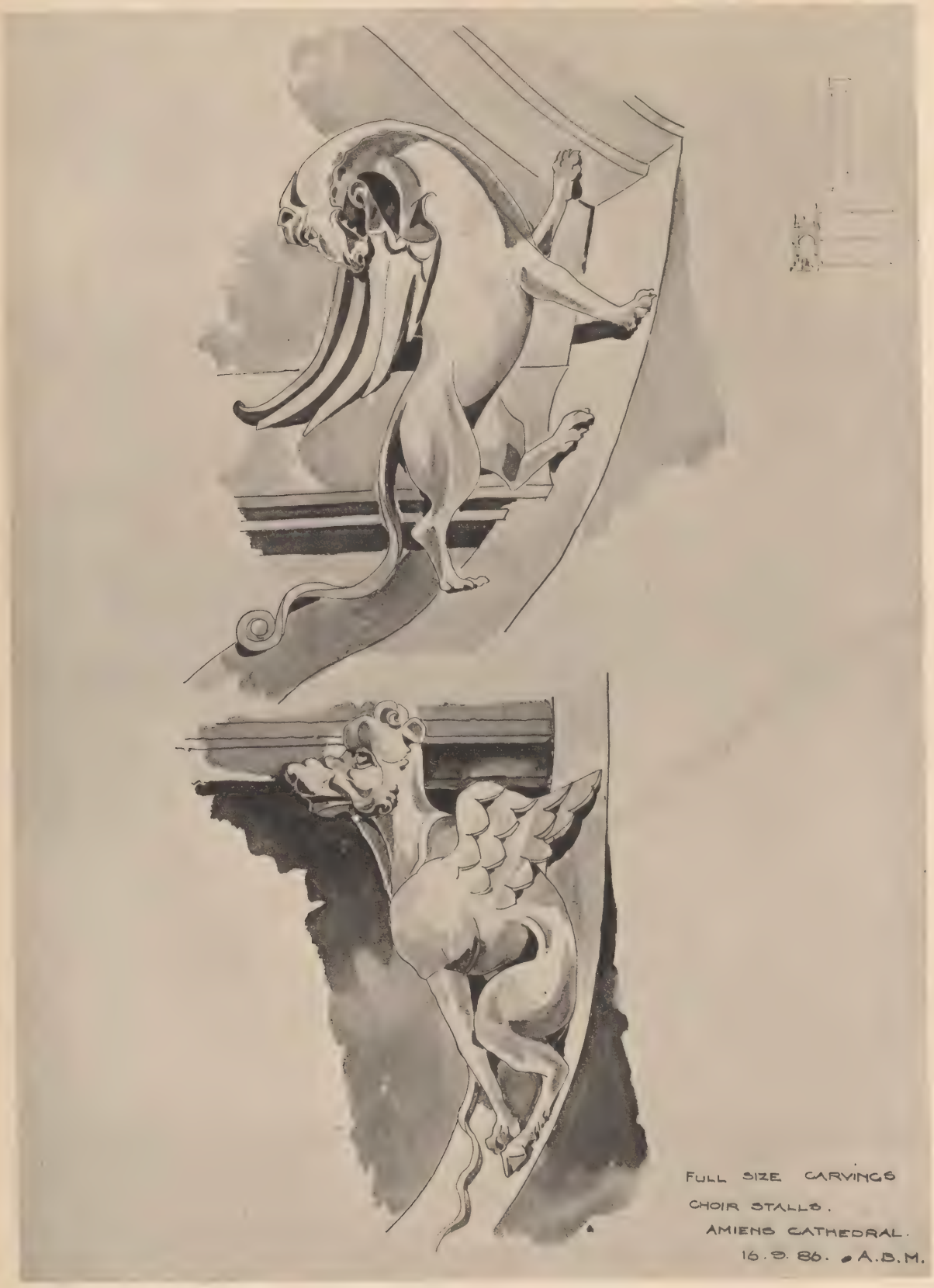
THE STALLS OF AMIENS CATHEDRAL, from



THE PHOTOTYPE Co., 303, STRAND, LONDON.

awings by ARNOLD B. MITCHELL, Soane Medallist, 1885.

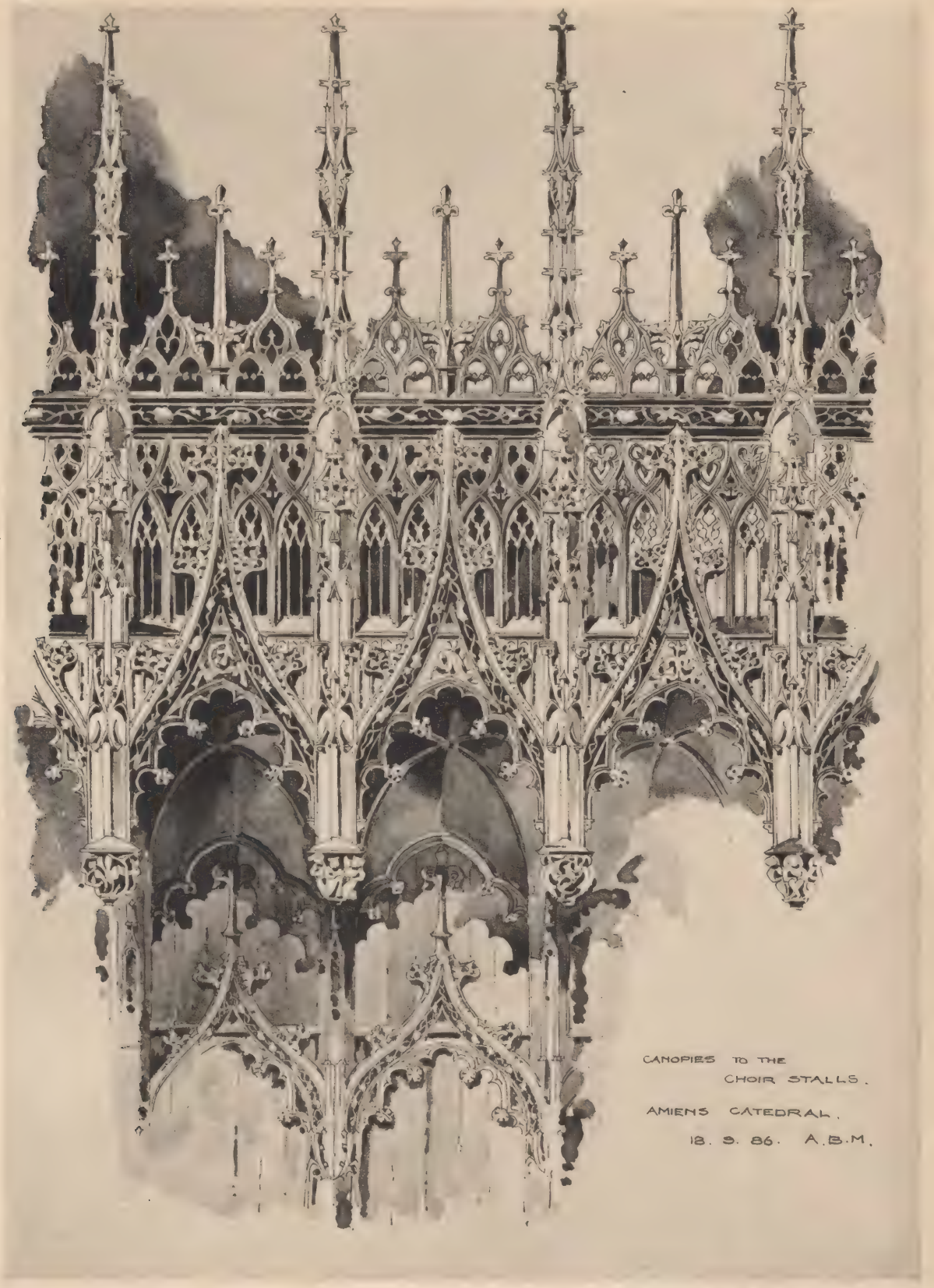
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THE STALLS OF AMIENS CATHEDRAL, fro

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TALY AND FRANCE (xiv).

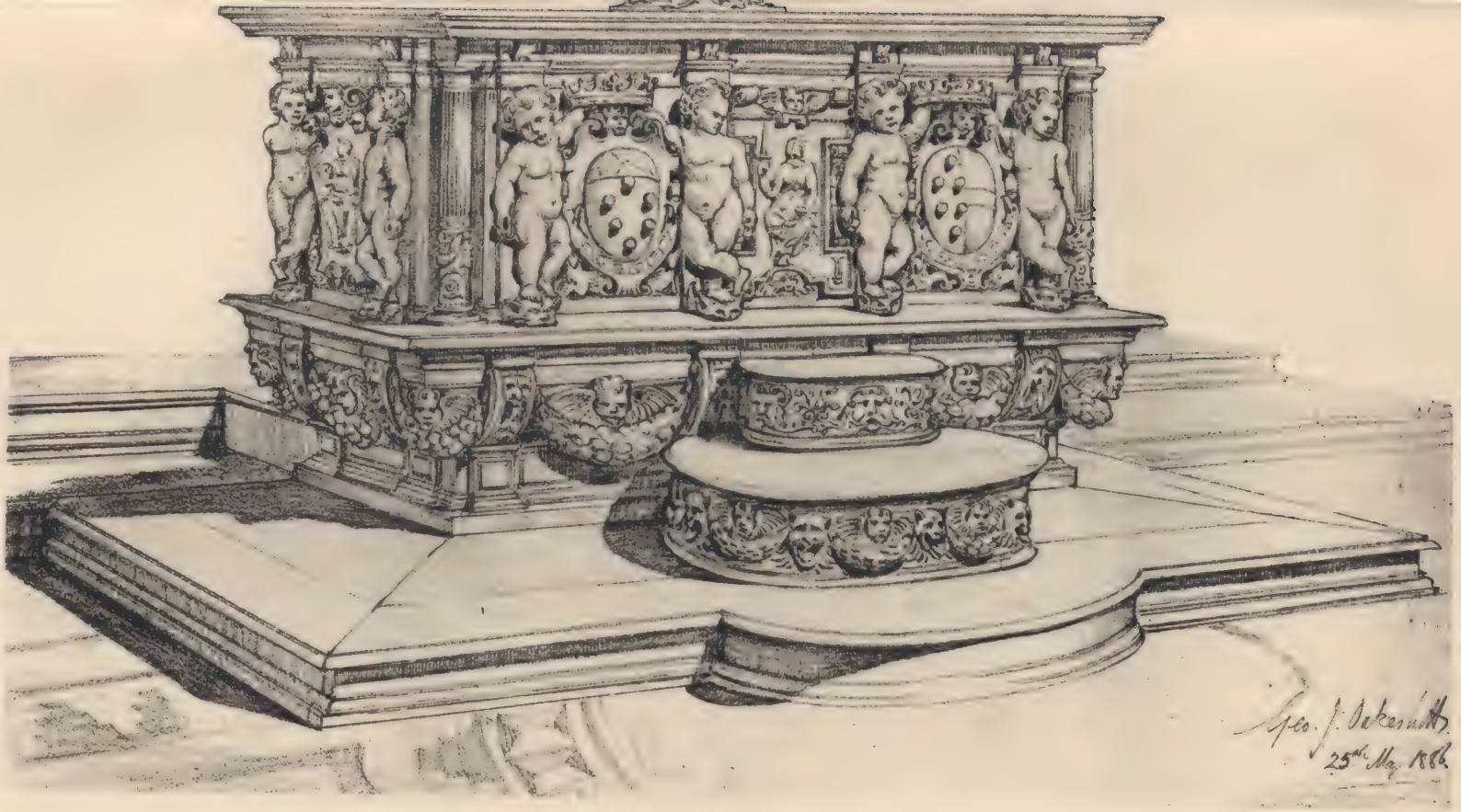


THE PHOTOTYPE Co., 303, STRAND, LONDON.

vings by ARNOLD B. MITCHELL, Soane Medallist, 1885.
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XXVII. TWO PENCIL SKETCHES (xv).





THE PHOTOTYPE Co., 303, STRAND, LONDON.

CARVED LECTERN IN THE CHOIR OF THE DUOMO, SIENA.

From a Drawing by the ALDWINCKLE TRAVELLING STUDENT.

[PAGE 44]

XXVII. TWO PENCIL SKETCHES (xvi).



THE PHOTOTYPE Co., 303, STRAND, LONDON.

COMUNICATORIO IN THE CAPPELLA DEI MEDICI, STA. CROCE, FLORENCE.

From a Drawing by GEORGE J. OAKESHOTT, ALDWINCKLE TRAVELLING STUDENT.

[PAGE 44].

XXVIII.

MARBLE: ITS USES AS SUGGESTED BY THE PAST.

By Mr. W. Brindley, F.R.M.S.

THE name Marble comes from a Greek word, signifying to flash, gleam, or sparkle, applicable to the various white marbles of Greece, which especially possess a sparkling appearance in their crystallisation, differing materially from those of Carrara. Judging from their works, I am of opinion that the Greeks only cared for white marble in architecture, except occasionally in a plinth, step, or back of a sculptured frieze of black, to make the white appear still whiter. This is further confirmed by their temples in Sicily, built of a coarse brown stone, of open texture, which they coated with *marmoratum*, a white stucco, made, as far as I have tested it, of pounded white marble and lime putty; the marble therein taking the place that sand does with us. This they rubbed up to a fine marble-like surface. Plenty of it still exists exposed at Girgenti. The Romans continued this process at Pompeii, even applying this composition thickly to their Composite capitals, modelling their foliage in it, and rubbing it up like carvings. If further proof be needed of the love of the Greek for white, we have it in his quarrying—for unquestionably the grandest quarries extant are those of Pentelicus, where his method of working in the time of Pericles has never been surpassed, if equalled; though the methods adopted at Carrara at the present time are undoubtedly Greek.

There exists on Mount Pentelicus, to this day, the ancient marble-pitched way, or slide, with the holes at the side, in the solid rock, in which the posts were fixed for lowering the blocks with ropes; and a small groove about six inches wide may be traced, cut in the rock, for the conveyance of water from quarry to quarry either for the purpose of drinking or working, but most likely for both. This slide passes a number of small workings, ascending to the great quarry, where the upright face of the rock still shows the ancient tooling. Here the bed, or vein of statuary, dips into the mountain, where the Greeks followed it, producing a huge cave which runs downwards. From this cave, they seem to have obtained their best statuary for sculpture, the chips I knocked off the rock being very pure. The débris of the floor is now all concreted together into solid "brêche;" and what struck me as interesting was, that the stalagmitic cement was of pure

crystalline marble. These beds of white and statuary marble are overlaid with large figured red and green Cipollino marble. This has nearly all been extracted and was taken away, at a much later date, by the Romans. Probably much of it went to Rome or to her colonial cities, and some used in Athens, notably the monolith columns of the Stoa of Hadrian. This Cipollino (which means onion-like markings) produces, when sawn across its bed, sea-wave-like effects [Illustn. xviii], to which the Roman and Byzantine architects were very partial. The Pentelican Cipollino, as mentioned, overlies the white diagonally. When the Romans began to quarry it, they found themselves unable to get their blocks to the Greek slide, therefore they took them down a narrow ravine, most likely with oxen, as is still practised in Tuscany. The grand base-rock of the Acropolis of Athens, with the Areopagus and adjoining hills, is a solid mass of rich coloured marble, consisting of rose, reds, browns, and greys, intermixed, and often brecciated. Although this beautiful material was on the spot, the Greeks entirely discarded it for their temples, and often with great labour chiselled it away, as may be seen in the case of the beautiful theatre of Dionysius on the southern slope of the Acropolis, the *cavea* of which was hollowed out of the rock; and the steps, afterwards cased with white marble, were cut out of the solid. The seats of the front row were each sculptured out of a single block of statuary which, for design and execution, are simply wonderful, and as comfortable as modern arm-chairs.

The Parthenon, the Propylæa, and other buildings on the Acropolis, as well as the more recent temple of Jupiter Olympius in the plain below, are all of an ivory white marble, rendered of a still warmer tint by the action of the sun's rays for many centuries, and when viewed under the blue of an Athenian sky the effect produced is most impressive. The immensity of the blocks, many of them at a great height, exquisitely wrought, and the fineness of the joints, especially in the great drums of columns, 6 feet diameter—so close indeed that I could not insert the edge of a sheet of letter paper—are perfectly astounding. These drums have evidently been rubbed together with sand and water, in position, till they have closely fine-bedded each other; there being a slightly dished-hole in the centre, about five inches wide, so that the work became marble on marble, compact and solid, with equal bearings as one mass all over. The faces of the beds were fine cross-tooled giving a hatched surface which, when rubbed, would soon come down together, the flutings having been cut in position after the columns were built.

Although the Greeks used only white marble, it was not from dislike to colour, but the opposite, for they required a white ground for the application of colour. Judging by the remains, they undoubtedly indulged in gold and colour very freely; and the great simplicity of many of the broad Doric mouldings was, I should say, for the purpose of receiving colour decorations. In the cathedral at Girgenti, there is a sarcophagus of good proportion in Greek white marble of the classic age, with simple mouldings, enriched by colour decoration. A series of archaic statues in good preservation, profusely decorated with colour thickly laid on in relief, has also been recently discovered, in excavating on the Acropolis at Athens. These are now in the Museum there, and are in good preservation. Whatever tools and appliances the Greek used, he was able to execute work as delicate as we can accomplish now, and to use the drill far more dexterously

than any modern workman, not excepting the Italian, who, as he sings his melody, seems to make his drill an accompaniment. All the quirks and sharp shadows in the hair and drapery of sculpture, with the beautiful undercuttings of ornament, he produced by the drill, nor was he ashamed of that tool, for after ploughing a long deep groove in a fold of drapery, or vein of an acanthus leaf, he accentuated the end by leaving the drill-hole. These drills, I take it, were the same as we now use, ordinary flat round-ended chisel shaped. It is thought the Egyptians, in the working of granites and porphyries, used tube drills and gem stones, but I have never found traces of their employment by the Greeks.

The introduction of coloured marbles, porphyries, and granites, in Classic architecture seems to be due to the Romans after their conquest of Egypt; their first ideas of monolith columns, one may imagine, were adopted from the colossal stones of Egypt, for the Emperor Augustus, B.C. 30, transported thence the obelisk now reared on Monte Cittorio.

It is interesting to note that the earlier buildings in Rome contain few varieties of coloured marble, and that when newly-acquired provinces were opened for commerce greater varieties were used. The colonial cities also, as their wealth increased, indulged in choice marbles for their theatres and temples. In the so-called Greek theatre at Taormina, the *scena*, in my opinion, is Roman; for the coloured marbles of the columns *in sitû*, as well as the broken columns lying about, are similar to those used by the Romans at Pozzuoli and the Theatre of Arles, the choicest being Africano with rose in it.

Pliny tells us the ancient quarries of Africano were in the Greek Island of Scio, and it was so called, not because the marble was African, but from its dark colour, like a negro. In this he was wrong, for, after a week's toilsome search last May, I found (not the quarries of Africano) but the very grand old workings of Porta Santa, whence the monoliths in St. Peter's and San Sebastian must have been cut, as well as the immense basin, 15 feet in diameter and 4 feet thick, discovered by Mr. Wood at Ephesus, on the ruins of which I also saw broken columns of the rose Africano; yet, throughout the whole of Constantinople not one fragment of it is visible.

The names given to coloured marbles unearthed in Rome are often very misleading, many of the varieties being from comparatively few quarries. For instance, this quarry of Porta Santa would yield six or more different kinds, whilst the quarry in Africa that produced the Giallo Antico, *Marmor Numidicum*, supplied also varieties of rose and orange breccias, which are commonly known by other names. This African quarry, situated in a remote corner of Tunis, on the verge of an extensive plain, possesses an interest second only to the Greek quarry at Pentelicus. Originally a small mountain of marble the Romans reduced its size considerably, and in addition bored a channel right through the rock. Here you can see distinctly where their monoliths were cut and rough hewn into shape, whilst still attached. A broken column, 24 feet long and 4 feet diameter, with its apophyge roughly wrought, still lies in the channel unattached, showing how the weight had been reduced as much as possible in order to facilitate the transport, some 30 miles across a hilly country, to the seaport of Tabarca. The chips

and waste were piled up in the plain below in the form of a great mound that still exists. A massive wall, of which the remains are still visible, enclosed these valuable quarries, and in the immediate neighbourhood are the extensive ruined monuments of an ancient Roman city. There is no appearance of marble in their construction, showing that the products of these quarries were reserved for Rome, where, according to Corsi, may be seen 172 columns still existing. In the palaces of the Cæsars I find it used in the lining of the walls, in slabs not more than half-an-inch in thickness; in the Basilica Julia the pavement is mostly composed of it; and in St. John Lateran, the Pantheon, and the Arch of Titus it is the material used for the columns. In the last-mentioned the joint is noticeable one-third up, immediately under the top of the reeds in the flutings. Most of the richly coloured marbles to be seen in Rome and elsewhere in Italy were probably quarried during the time of the Cæsars, some of the quarries being Imperial, while others were either private property or subsidized by the State. Strabo, who lived at the commencement of the Christian era, writing of Laconia, where the old quarries of Rosso Antico have been discovered, says, "Those of the Tænarian marble in Tænarum are "ancient, and certain persons, assisted by wealthy Romans, lately opened a large quarry "in Taygetum." This would be the green porphyry or serpentine of the Italians. The ancient quarries of Egyptian or purple porphyry have not yet been found, the statements of modern writers as to their locality having proved incorrect, and the Syenite granite, out of which the obelisks were wrought, having been mistaken for the more valuable material. Porphyry (implying the purple variety) has always been considered as Imperial in architecture, from the earliest times; and justly so, for no material can approach it, either in colour, fineness of grain, hardness, or toughness. When used alone, its colour is always grand; and in combination with any other coloured material, although displaying its nature conspicuously, it is always harmonious. Such is its durability that columns, wrought nineteen hundred years ago, still retain their freshness of colour. It was obtained in large sizes, only exceeded by the granites of Egypt and the green Cipollino of Carystus in Eubœa, monolith columns of which, 38 feet long, are still in position in the portico of the Temple of Antoninus and Faustina, at Rome. This Cipollino was one of the marbles most appreciated by the Romans, for, in Rome alone, there are still remaining over five hundred columns, and throughout Italy it is very abundant. It is found also at Carthage, and other ruined cities in West and North Africa, along with Pavonazza, and other rare Roman marbles. Good Cipollino is now again obtainable.

Under Constantine the Roman temples appear to have been allowed, in many instances, to fall into decay, when they could not be adapted, as many of the basilicas were, to the Christian religion. From the time of Justinian, for a period of nearly a thousand years, these temples were used as quarries for supplying materials for the building of Christian churches, and to the re-use of these Roman marbles by the Byzantines we are indebted for some of the most beautiful and interesting examples of that style of architecture. The great sea wall of Constantinople, built for long distances with continuous slabs of white marble, between three and four feet square, and with discs of varying diameters in horizontal rows, to be counted by hundreds, shows how great must

have been the destruction of earlier monuments. Where the sea has broken down this thick wall you can see that these circular discs are columns, used for bond, the square slabs being the upper beds of carved capitals, or the lower portions of moulded bases; the carving of the capitals being as beautiful as they are varied in design.

The Byzantine interiors, in regard to colour, are unquestionably the most charming examples we have of marble decoration; but I venture to say that there are very few architects of the present day who, given the same materials, would have the courage to economize them as the Byzantines did, for from what I know, the cost would often be double that which would have satisfied a Byzantine architect. These interiors are really cheap for their effect, and it is instructive to note the small quantity of marble used. Take, for example, St. Sophia, where you will find 2,000 feet superficial of delightful decoration of a durable character, cut out of a single block of Cipollino marble: the whole opened out, making a continuous pattern. When an angle is reached the inch edge is honestly shown, without any desire to disguise or make believe anything different from its intention, viz., thin applied decoration, and nothing more. Where there occurs a surface, circular on plan, to be covered with marble, a series of narrow slabs, producing a polygonal surface, has been opened out, thus saving half the cost in material and labour had they been worked out to the circular plan, in the same way as the cornice and base mouldings. The result is quite satisfactory.

Several of the smaller churches of Justinian in Constantinople are quite as suggestive as St. Sophia, showing skill in surface decoration. The system frequently is to cover the wall with a series of oblong panels in tiers of rich marble opened out, framed with narrow white mouldings and bands of different colour, continuous horizontal lines of colour on white being introduced between the panels; the whole surmounted by a marble mosaic frieze, with a cornice carved so as to produce small, sharp triangular shadows [Illustn. xxi.]. This system also particularly applies to St. Mark's (Venice), but at Palermo a more elaborate method is adapted, where the great marble panels are framed with bands of very choice mosaic.

The marble balustrade round the gallery of St. Mark's was probably copied from that of St. Sophia, where the solid panels have been worked for their position, whereas in St. Mark's the panels are, I believe, only the fronts and ends of old sarcophagi sawn up, and put together with as little new work as possible. The same kind of treatment is observable at Ravenna, Arles, and Constantinople, as well as the exterior of St. Mark's, the old Cathedral at Athens, and some later churches in Italy. At St. Mark's almost any early carved stone that was found was walled in so as to be seen. This proceeding is surely commendable, and if our mediæval architects had done the same with the works of their predecessors, instead of burying them within the walls, we should have been grateful.

The earliest marble pavements, probably those in Greek temples, are usually thick white slabs of large dimensions. The Greeks also brought tesselated mosaic pavements to the highest perfection. From them the Romans obtained their knowledge of this art, and transported to Rome many of the most beautiful pavements found in their

cities. The Romans themselves soon became proficient in this class of work, for we find it universally used throughout the Empire even as far as Britain; and although no kind of pavement has left so enduring a mark, yet it fell into disuse in this country from the time of the departure of the Romans.

We have to thank French architects for its revival. Unfortunately at the present time, when anything to succeed must be cheap, these modern pavements are very inferior in durability to the ancient ones. They cannot possibly last where there is hard traffic, as frequently, when they are rubbed down, they are under half-an-inch in thickness, whereas the fragments picked up in Rome, although only half-an-inch square at the surface, are nearly one inch thick. I have seen quantities laid where one old tessera could be chopped into three modern ones. A good concrete foundation is necessary for the success of all these pavements, for want of which the Roman pavements in this country usually failed.

Some of the grandest ancient pavements are the simplest, *i.e.* those of the Basilica Julia [Illustn. xviii.], of St. Sophia [Illustn. xix.], and the one under the central dome of St. Mark's. The two last are made out of a large block of Cipollino marble, sawn into slabs, and opened out into one grand square, and round this being a border of Opus Alexandrinum mosaic, which gives a carpet-like effect to the whole. I differ entirely from those who think that St. Mark's pavement was always bent and distorted as at present. These slabs being sawn from a single block, the waste of working them crookedly would have prevented the markings opening out into one connected pattern. If this pavement should ever be repaired, I think the broken slabs will be found level underneath, and if reversed would produce an even surface [Illustn. xix.].

The pavement in the Basilica Julia remains in part very perfect, although the immense structure itself has been removed with other buildings of the Forum, for the erection of churches and palaces. The plan is a rectangle of about the proportion of two squares; the centre space being divided into three squares and four broad bands. The squares consist of large slabs of Giallo antico, with a broad border of Pavonazzetto, the broad cross bands being rectangular slabs of rich Africano and Porta Santa. This central pavement is surrounded for about fifty feet with large slabs of Greek white marble.

The mosaic pavements of Opus Alexandrinum, so frequent in Italy, and of which there is a good example in Westminster Abbey, are usually composed of but few colours, red and green porphyries with white palambino for the mosaics, the bands being nearly always Greek white marble. The patterns severally consist of intertwining circles and squares with bands, divided into three parts, the middle being mosaic of geometrical patterns. All the materials are roughly chipped into form, leaving, when fixed, large joints which produce a good effect.

These pavements have always been made out of old materials, the circular porphyry plaques being, with few exceptions, transverse slabs of ancient columns applied with a narrow or broad setting of mosaic pattern, as may be required, to fill up the circle in the bands; the plaques of green porphyry are always small, this material being only obtainable in small irregular pieces.

The variety of geometrical design in these pavements is amazing [Illustn. xx.]; some of the most beautiful are in Palermo, where an Oriental character is engrafted into them, produced by simple lines of white threading the pattern. This kind of pavement is the most costly, the porphyry being valuable, and having to be cut with diamond powder. If architects, when designing this description of mosaic, would draw as if the work had to be executed with thick cut plate-glass, they would then realize the difficulty of very acute angles, bearing in mind that such forms as stars must be produced by lozenge-shapes put together, and consequently must entail extra cost.

The great pavement of Siena Cathedral, consisting of pictorial subjects in dark black green marble and mastic inserted into thick slabs of white marble, is one of the finest works in Italy of the Renaissance period; but it has not worn well, owing to the filled-in colour parts being softer than the white, and the solid slab surface in the design being insufficient to tie the colour together, and to take the wear.

The filled-in lace-like patterns, used as borders round the monuments at Sta. Croce, Florence, have withstood the wear of time longer, and are in a much better condition, owing to the infillings of colour being in smaller quantities. This filled-in work might be produced in lead on a white ground, and would look very well. The marble pavements, in squares of black and white, seem to have been introduced into this country about the time of Torregiano; and were largely employed, as at King's College Chapel (Cambridge), the Beauchamp Chapel (Warwick), and in domestic work generally, until the Gothic revival, when they almost ceased to be used. These marble tile-pavements are usually prepared by boys out of the waste from the quarries. They are roughly pick-tooled into shape on the spot, then taken to the water mill, placed on a rude rubbing-bed till one face is ground flat, after which their edges are tooled off to what size they will square, the back remaining rough. The white ones come from Italy, and the black from Belgium, where thin shaley beds of marble are found between the thicker ones. These pavements never fell into disuse with the Dutch and Belgians; and the demand for them now is so great that it pays to prepare them out of sawn slabs of equal thickness, effecting a material saving in the cost of fixing.

Our mediæval builders used coloured marbles very freely in their church architecture, for strengthening columns and piers, tying the vertical lines of colour together with thin horizontal lines of the same material, in string mouldings and the abaci of capitals. The colour used was the retiring grey Purbeck, Petworth, or Frosterley, and occasionally, where strength and colour were wanted to the arch springers, the capital would be carved in the same material. The work was always well done, the mouldings and carvings being as full of detail as those executed in easily worked stone. On the score of economy nothing can be learnt; but in the value of retiring greys, as in arcading, they give distance, and hold their own with quiet dignity, as something of extra value. Contrast them with our marble work during the Gothic revival, when the colours selected were glaring and varied, often destroying the repose and distance that would have been obtained if quieter and more uniform colours had been selected. These same remarks apply to many of the works in marble, of Renaissance character, executed within the last

few years, our great failing being the use of too many colours in one work. The most admired of the large altars and monuments in Italy, of the Renaissance period, are executed in white marble, with only one colour introduced for the columns, pilasters, frieze, pediments, and the panels of the base. There is a variety of marble work of a late date which is very common in the Renaissance churches of Palermo and Naples, consisting of profuse inlaid floral arabesque, of orange, red, and brown marbles, with black inserted into white. The work is splendid, but gaudy, being entirely deficient in repose.

Polished marbles and stone rarely go well together in the same work; and should one succeed in producing an agreeable effect it seldom remains satisfactory long, owing to the stone becoming dirty, making the contrast with the marble as disagreeable as it is pleasing when new. Some marbles, such as greys, reds, and Cipollinos, look very well dull polished, and in this state would go better with stone.

When economy is required English alabaster is in every respect an excellent material to work with marble, its cost when wrought being about half-way between good stone and marble. Alabaster is only used for interior work, but, if selected free from earthy veins, and used in positions where wet cannot run over it, I believe it would stand far better than many stones, and would keep its colour; of all building materials it is about the least porous or absorbent. The inner arch-moulding of the west doorway of Tutbury Church, carved into bird's beak of the Norman date, is in ordinary alabaster and remains in good preservation, except where the rainwater trickles over it; in these places furrows are worn in it. Alabaster has been used for monumental work from a very early period. The effigy of Bishop Branscombe in Exeter Cathedral, of the 13th century, is in alabaster, the orphreys of the vestments with the ornaments of the mitre being gilt; it is an example of alabaster brought from a long distance, although in Derbyshire and adjoining counties sepulchral monuments in this material are numerous.

The most delicate work has been executed in alabaster, two prominent examples being the monuments of John of Eltham, 1335, and of Queen Philippa, 1370, both in Westminster Abbey. About that time it was in general use in Derbyshire for incised floor slabs, filled in with black mastic after the manner of Brasses, a practice which continued to a late period. During the Elizabethan period, and subsequently, alabaster became the material most used for important historical monuments, the columns and plaques being of black marble, the whole heightened with gold and colour, producing a character of their own, of which we are justly proud. I would further here remark of two important memorials in the lady-chapel of Rouen Cathedral,—one of Cardinal Amboise, the lower portion of which is in statuary marble,—the life-size kneeling figure of the Archbishop and the canopy work is alabaster, executed in 1525; the other opposite, of the time of Francis I., attributed to Jean Gougon, and stated to be in white marble, is also alabaster; and in both cases I believe it to be Derbyshire. At Keddleston Hall, Derbyshire, there are beautiful columns, with pilasters, of this material. The Assyrian man-headed winged lions in the British Museum are also of gypsum alabaster.

There is one class of marble work that has held an important position through all periods of architecture, but unfortunately is now much neglected, viz., sepulchral

monuments in our churches. In the past, nothing has rendered our old churches more interesting and picturesque than the introduction of such monuments, but since interments have taken place in cemeteries nearly all this class of work, which ought to be architecturally good, has fallen into the hands of the ordinary cemetery mason.

We rarely place in our churches now anything, even in the way of tablet, or floor slab, however small or simple, to remind us of those whose memories are near and dear, and who may have been constant worshippers with us. These memorials need not be large; many of the old ones are not over a foot superficial. We have plenty of examples of our own, in addition to which the churches and cloisters of the continent, from Lubeck to Naples, are filled with most interesting and variable examples and types. Memorial slabs of incised marble preceded Brasses, and have withstood the rough usages of time even better than Brasses, of which there is frequently only the matrix left in the slab, whereas the marble slabs are not worth stealing, as they cannot be put into the melting pot, should the church suffer desecration. We are indebted to incised marble slabs for most of our earliest records, which, had they been on metal plates, would doubtless have been lost to us. The English Renaissance, particularly in the works of the Brothers Adam, has left marble work in chimney-pieces equal if not superior for its purpose to anything on the Continent. The designs are good, and suitable to the marble, which is usually of the best quality; the construction is well thought out for economy of costly material and labour, and the workmanship is nearly always excellent, many of the mouldings being delicately rubbed out with sand and iron reverses. The simpler chimney-pieces also are equally good, consisting of jambs and architraves delicately fluted, reeded, panelled, or inlaid with plaques of coloured marble carefully studied so as not to destroy breadth of effect.

The onyx marbles of Algeria, Mexico, and California (which are of the same nature as the Oriental alabasters) can be cut and ground sufficiently thin for window purposes. The fluor spars (like the Blue John of Derbyshire) are the most beautiful, but to render them durable, and to enable them to retain their colour, they ought to be mounted on plain glass and rubbed down very thin, like microscopical sections; after which it is requisite to place glass over them to prevent the condensation of moisture which would soon destroy their beauty. There are some good examples in orange-yellow Oriental alabaster at Tarragona Cathedral, also at Orvieto.

The east windows of San Miniato are slabs of antique Pavonazzetto with red purple markings, nearly two inches thick. Almost any marble with crystalline statuary ground an inch thick, placed on the sunny side of a church in Italy, would admit sufficient light for worship, but would not do in our variable climate.

Great Britain and Ireland contain many varieties of well known coloured marbles, but these are little used in comparison with foreign marbles, owing to bad quarrying and high railway rates; the cost from Devonshire is twenty-five per cent. more than from Italy. Blocks from Greece cost less for freight than the same would from Wales; and thus London, like ancient Rome, obtains its marble by sea.

I believe, if consistent detail were used, Carrara marble might be employed for some

of our public buildings and street architecture, there being plenty of durable material, though large quantities that are imported would decay. A marble to stand exposure to the weather should be close, hard, and vitreous-looking. The mouldings used with marble linings in the palaces of the Cæsars, and other important buildings in Rome, even of a good date, are usually very simple, and mostly consist of flat hollows and rounds, with small fillets produced out of a chamfer. Mouldings of this kind look well in marble and cost less than many modern ones, which are designed, forgetful of masons' methods of work. Mouldings also should be designed with special reference to colour. For instance, where the light strikes on polished convex forms in black marble, it is light producing very strong contrast with the reverse lines, therefore the most delicately drawn section will show in black; in a lighter colour it would look quite different. I would here remark that, in the most important works executed in white marble by the Renaissance sculptors of Tuscany, the masonry was not polished, but left from the chisel.

Marble linings, whenever possible, are best fixed hollow at the back, and a few small places left open in the joints, until the solid walls are dry, the hollow allowing the slab to keep warmer than the solid wall, thus preventing condensation. Good well-slacked lime mortar is best for bedding. Roman and Portland cements must be avoided, and plaster of Paris should be mixed with a little lime putty, to assist adhesion and prevent swelling.

The finest collection of specimens was brought together by the late Signor Corsi, and it is now deposited in the University Museum at Oxford. The most instructive collection is in the Museum of the Louvre. In France they appreciate columns, of antique coloured marbles, as objects of beauty, using them as studies both for form and colour. A further hint we might take from Paris is in the museum attached to the École-des-Mines. There the wall surfaces are spaced out so as to represent different geographical areas, thus enabling you to see at a glance everything geological in each Département likely to be of use, viz:—its earths, sands, clays, limes, stones, marbles, and granites. The French have in addition a complete series of cubes of the various rocks of France, with a note of where quarried.

W. BRINDLEY.

[Addenda by Dr. Freshfield, F.S.A., *Hon. Associate.*]

The coloured drawing [Illustn. xxi.] and the photograph [Illustn. xxii.], exhibited by Mr. Brindley, are taken from the internal decoration of an ancient building which is now called the Kakrieh Mosque; and it is in many respects one of the most interesting in Constantinople of the smaller churches. This building, which was the church of a large monastery dedicated to the Saviour, went by the name of the Mone tes Choras. The foundation of the monastery was one of great antiquity, and it lay outside the wall of the city as originally built by Constantine, and it was from this, I think, that it got its name of the "Monastery in the Country or the fields." If it was included in Justinian's wall it was just as much as it was, but when the wall, from the Hebdomon to the sea, was built by the Emperor Heraclius it fell, as it is now, well within the city.

There were three epochs at which this church was repaired, and as this is interesting,

as marking the date of the ornamentation exhibited in Mr. Brindley's drawing, I may as well mention them. The church was substantially built by Justinian, and the whole of the centre part of it is his work. It was altered in the reign of the Emperor Alexius Commenus, about the time of the Norman invasion of England. It was further repaired at the end of the thirteenth century by Theodore Metochita, the Grand Logothetes, who built the two narthexes, and generally repaired the church, and practically rebuilt the monastery. The marble decoration drawn by Mr. Brindley, I am of opinion, was part of the original decoration in the time of the Emperor Justinian.

We have in the church of the Pantokrator an instance of marble decoration as in use at the time of the Emperor Alexius Commenus, and it is so different from that of the Mone tes Choras that it cannot be of that date, nor can it be of the date of the last alteration by Theodore Metochita, because, as may be seen in the photograph [Illustn. xxii.] of the ornamental carving which was undoubtedly executed under Theodore's orders, this ornament in part destroys the marble decoration at that part. This carved marble ornament is interesting because it formed the southern wing of the iconostasis or picture screen, a piece of ecclesiastical furniture which the Turks carefully destroyed, and of which there are only a very few fragments remaining in Constantinople. As it happens, it may be usefully compared with a similar fragment in the larger photograph.

The other photograph [Illustn. xxiii.], exhibited by myself, is also very curious. This church is very remarkable. Its Mohammedan name is the Kalender Khanè Djami; and at present we have been unable to identify it with certainty with any described church. There are certain features in the dome which point to its being of early rather than of late construction; on the other hand, there is a part of the internal construction of this church, which must be coeval with its building, which points to a date not much earlier at all events than the ninth century, and this is the date that I have fixed approximately as the date of the church. The two marble slabs which form part of the iconostasis of the church are, in my opinion, of a later construction. I do not think that this ornament is as early as the church.

One great peculiarity attaching to this church is the fact that it has a square termination. This is extremely unusual in Byzantine churches which, I should have said, but for this example, invariably terminate in an apse, either circular or octagonal, and after the reign of Justinian in three apses. This church is arranged so as to have the appearance of a nave with two aisles answering the purpose of the corresponding arrangement of a triple apse. This triple arrangement points to a date later than the Emperor Justinian; on the other hand, the pillars forming part of the construction at the west end, and which obviously formed part of the original church, having a classical form of capital, mark the date as being about the 9th century. The classical form had been abandoned in the reign of the Emperor Justinian, and did not come into use again in Constantinople until there was a classical revival somewhere about the ninth century, so that we may fix this building as of about that date.

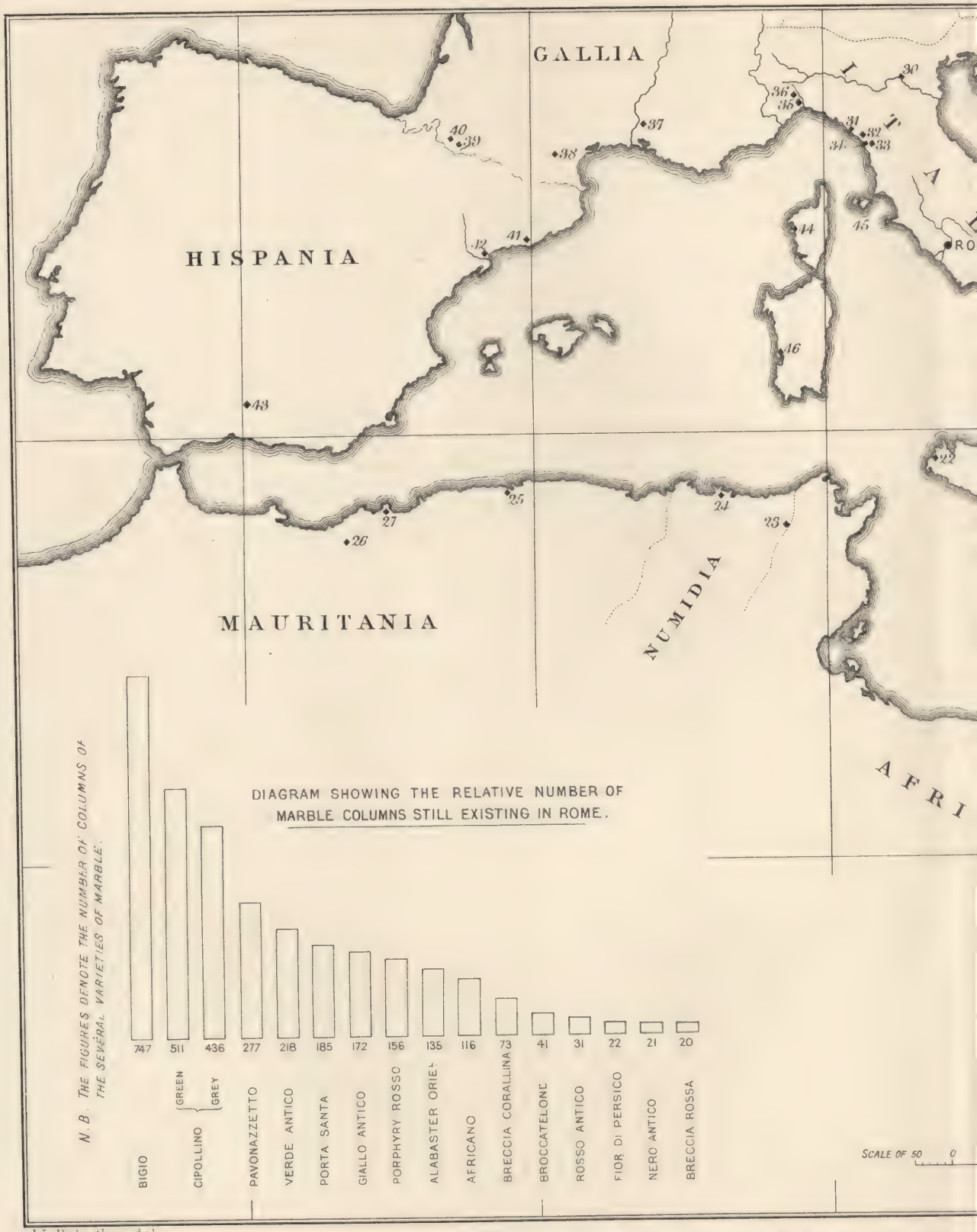
EDWIN FRESHFIELD.

THE PRINCIPAL QUARRIES WORKED IN THE TIME OF THE ROMANS.

Egypt.	1. Syenite granite (red). 2. Grey and white granite (pepper and salt),—supplied the columns of the portico of the Pantheon. 3. Porphyry (?). 4. Oriental alabaster. 5. Breccia verde.
Ancient Greece and Asia Minor.	6. White marble of Pentelicus. 7. Grey marble of Hymettus. 8. Black marble of Laconia. 9. Rosso antico. 10. Green porphyry. 11. Cipollino,—supplied the large monolith columns of the Temple of Antoninus and Faustina, Rome. 12. Verde antico (?) 13. [The modern Verde antico comes from here]. 14. Parian marble. 15. Porta Santa marble. 16. Samian white marble. 17. White marble,—partially supplied Ephesus. 18. Fine grained Pavonazzetto. 19 & 20. Grey and white,—supplied Constantinople.
Sicily.	21. Red and grey of Taormina. 22. Jaspers.
North Africa.	23. Giallo antico (Simittu Colonia). 24. Grey Cipollino (close to modern Philippeville). 25. Rosso (Etruscan), Mauritania. 26. Oriental alabaster (used by the Romans at Tlemsen, Mauritania). 27. Marbles of Kléber (never used in Rome).
Italy.	28. Supplied the palace of Diocletian at Spalatro. 29. Istrian marbles,—supplied Venice. 30. Verona red and orange (Broccatello). 31. Luini (ancient Etruscan). Rosso di Levante. Porto Venere (black and gold). 32. Various marbles of Carrara (white, grey, Pavonazzetto, and Breccia). 33. Verde di Prato (extensively used by the Florentines). 34. Red marble of the Maremma, used in Florence (colour liver red). 35. Verde (Polcevera). 36. Rosso (Polcevera).
France.	37. Brêches Saint-Antoine, and shell Lumachella marbles. 38. Griotte and Languedoc marbles. 39. Serancolin(Pyrénées),—supplied great monoliths of the Opera House, Paris. 40. Campan vert, and Campan melangé.
Spain.	41. Rose marbles of Tarragona. 42. Antique Broccatello (red and orange mixed). 43. Green marbles of Granada (used at the Alhambra; also used at Tlemsen, and brought over by the Moors).
Corsica and Sardinia.	44. Verde antico. 45. Fior di Persico (Fleur de pêche). 46. Grey granite (?)

W. BRINDLEY.

*** The numbers refer to the skeleton Map [Illustn. xvii].



W. Brindley del

SKETCH MAP OF THE ROMAN EMPIRE, SHOWIN



THE SITES OF THE PRINCIPAL QUARRIES IN USE.

XXVIII. MARBLE, ITS USES AS SUGGESTED BY THE PAST. (XVIII)





W. Brindley del.

(Page 50)

SCALE OF ENGLISH FEET

CENTRE PART OF THE PAVEMENT OF THE BASILICA JULIA IN ROME.

[Page 50]

St SOPHIA, CONSTANTINOPLE.

[PAVEMENT ON UPPER FLOOR]

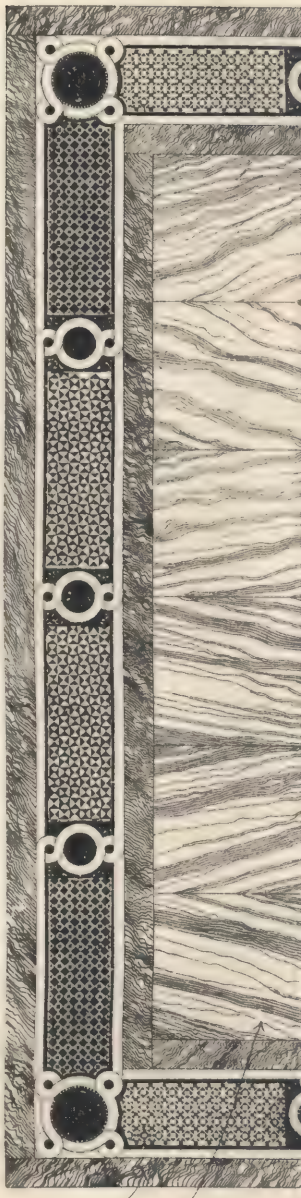


W Brindley del.

THESE THREE PAVEMENTS ARE DRAWN TO THE SAME SCALE AS THAT OF THE BASILICA JULIA ON ILLUSTRATION XVIII.

GREEN CIPOLLINO
GREEN PORPHYRY AND WHITE
MARBLE MOSAIC.

SLABS OF VERDE ANTICO.
RED PORPHYRY AND WHITE
MARBLE MOSAIC.

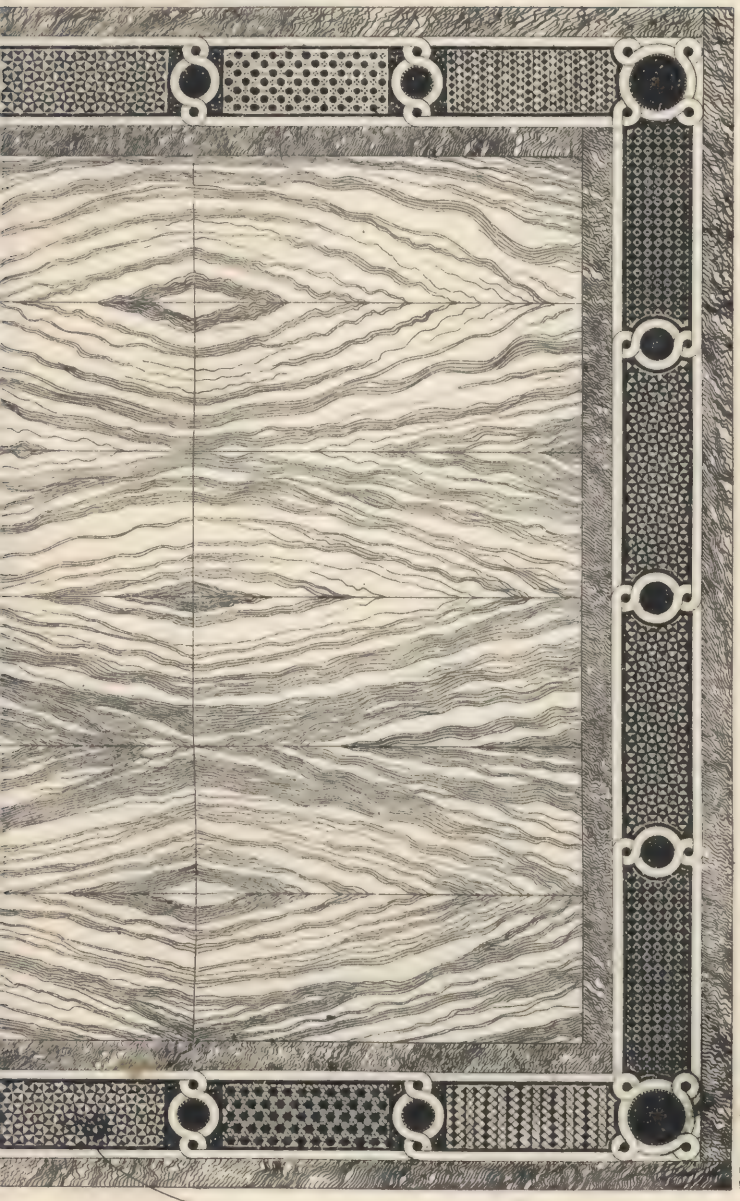


GREY CIPOLLIN
LUMACHELLA OF V
(CALLED SAN VITAL
THE WHIT

[Page 50]

ST MARK, VENICE

AVEMENT UNDER CENTRE DOME.



W Brindley del.

MOSAICS OF GREEN AND RED
PORPHYRY, AND PALAMBINO (WHITE)

A

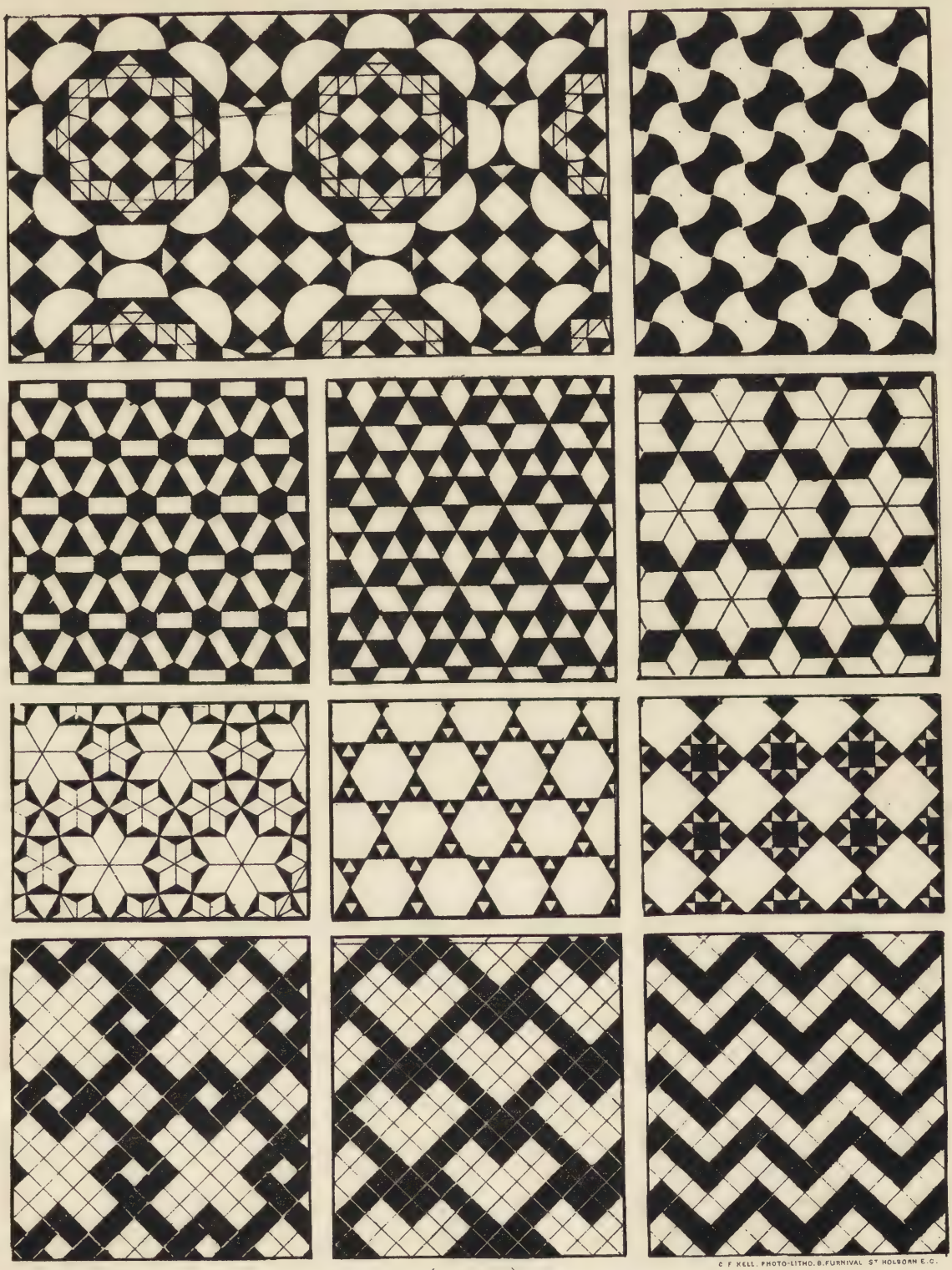
S PARIAN MARBLE, AND THE CIRCLES ARE FILLED
WITH RED PARPHYRY.

CHURCH OF THE PANTACRATOR, CONSTANTINOPLE.



THE LARGE OBLONG SLAB AND THE SQUARE SLAB ARE OF VERDE ANTICO.
THE CIRCLES AND OTHER OBLONGS ARE FILLED WITH SLABS OF RED PORPHYRY.
THE WHITE IS PARIAN MARBLE, AND EACH SIDE OF IT IS A LINE OF YELLOW PALAMBINO.
THE EXTERIOR BAND IS OF BIANCO NERO (WHITE AND BLACK)

FROM DRAWINGS AND MEASUREMENTS MADE BY MR BRINDLEY.



C. F. KELL. PHOTO-LITHO. 8. FURNIVAL ST. HOLBORN E.C.

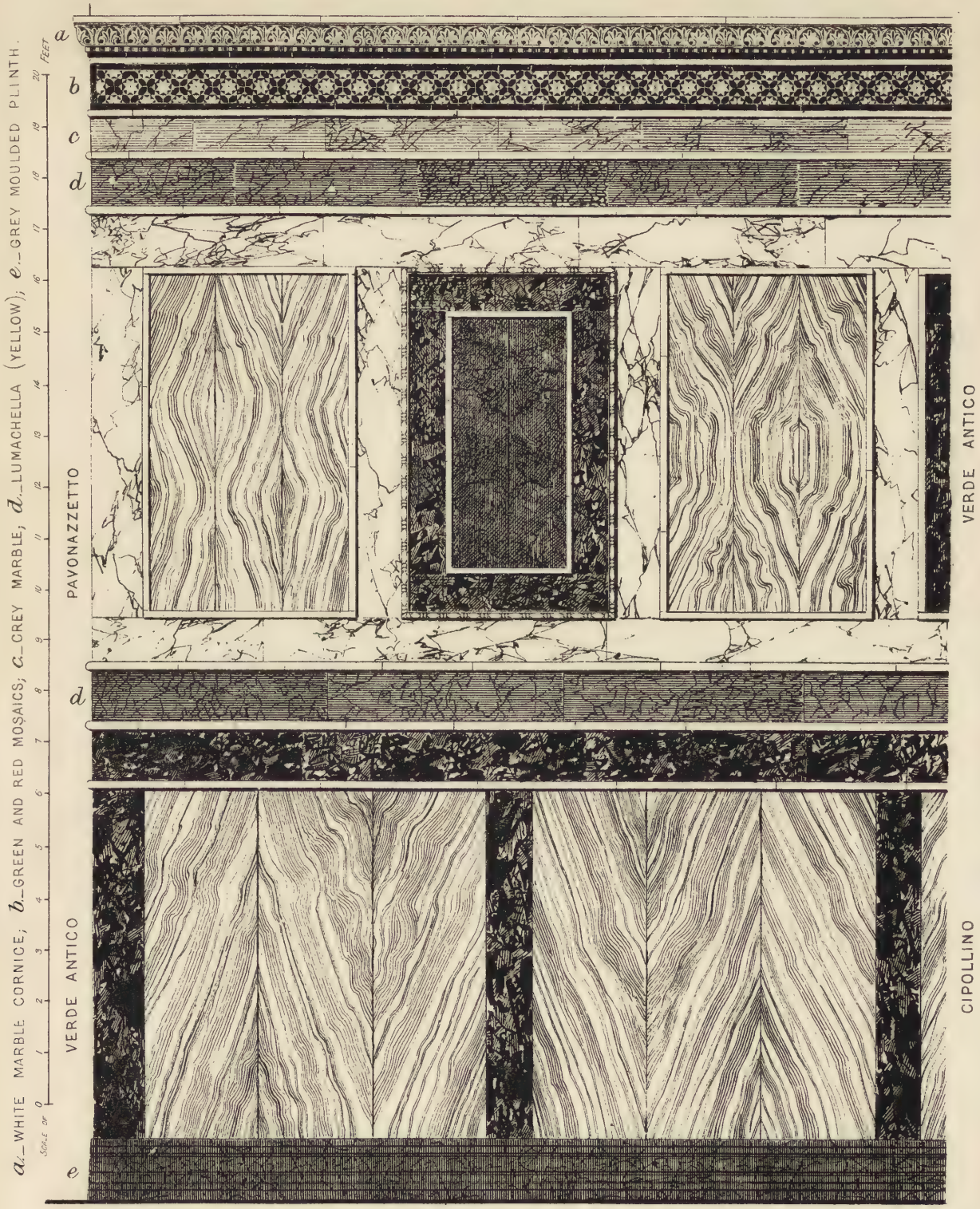
W. Brindley del.

[Page 51.]

OLD ITALIAN EXAMPLES OF MARBLE PAVEMENTS.

[FROM MR BRINDLEY'S COLLECTION.]

XXVIII. MARBLE, ITS USES AS SUGGESTED BY THE PAST. (XXI.)



a.—WHITE MARBLE CORNICE; *b*.—GREEN AND RED MOSAICS; *c*.—GREY MARBLE; *d*.—LUMACHELLA (YELLOW); *e*.—GREY MOULDED PLINTH.

W. Brindley del. (Pages 49. 54.) W. F. KELL, PHOTO-LITHO. 8, FURNIVAL ST. HOLBORN, E.C.

WALL DECORATION, KAKRIEH MOSQUE CONSTANTINOPLE.



The Phototpye Co,, 303, Strand, London.

INTERNAL DECORATION OF A CHURCH AT CONSTANTINOPLE, NOW THE KAKRIEH MOSQUE. [Page 54.]
From a Photograph.



INTERIOR, LOOKING EASTWARD, OF A CHURCH (USED AS A MOSQUE), NEAR

Reduced from three Photographs. Taken



E EAST END OF THE AQUEDUCT OF VALENS, CONSTANTINOPLE. [Page 5]

Dr. FRESHFIELD, F.S.A., *Hon. Associate.*

XXIX.

MUD ARCHITECTURE: NOTES MADE IN PERSIA AND OTHER COUNTRIES.

By William Simpson, R.I., F.R.G.S., *Hon. Associate.*

THE title of this Paper is meant to include Mud when used directly in building, and also when the same material has been formed into bricks and dried in the sun. Walls formed by either of these means, or by a mixture of both, which is not uncommon, are literally identical. It may be added that where sun-dried bricks are used, mud may be presumed to be the mortar, so that the wall in this case presents no difference in the material of which it is composed from that of the other. As fire-burnt brick is only the next step in advance from sun-dried brick, it might almost be included, but I intend as a rule to limit myself to the subject as already defined.

This Paper is the result principally of observations and notes made in the Winter of 1884-85, when I accompanied Sir Peter Lumsden and other members of the Afghan Boundary Commission.

The Commission travelled to Central Asia on that occasion through Persia. Beginning at Resht, on the Caspian, we crossed the Elburz range to Tehran; then from Tehran eastwards through Khorassan to Meshed, and from that to Sarrakhs on the Heri Rud. As the Russian Commissioners did not keep their appointment to meet us at that place, we marched south along the Heri-Rud to Kuhsan, where we met the camp from India. This was about sixty miles from Herat. From Kuhsan we went north-east to Penjdeh, on the Murghab, and then turned south, ascending that river viâ Meruchak to Bala Murghab, where we wintered. I returned again in the Spring direct to Meshed, and west by the route we went as far as Shahrud, where I struck off to the right to Astrabad, and Keneri Gez, at which place I found the Caspian steamer. This is a large amount of ground; and, with the exception of the Elburz range—the district there being Mazenderan—I found that mud is to this day the principal material used in building. Mazenderan is well wooded with fine timber of all kinds, and, being mountainous, stone is plentiful. In such a locality mud is the exception; still even at Astrabad I found that the walls of that town, which inclose a very large space, are all of mud. Burnt brick is used for important buildings, and many of the newer erections at Tehran are of this material.

Most of the caravanserais on our line of route were the same. These places, which are important for the protection of travellers at night, in a country infested with bands of marauders, are large and commodious; indeed they are the principal buildings to be seen in Persia. At two places, Ahwan and Pul-i-Khatun, we found the ruins of old caravanserais which had been strongly built of stone. The one at Pul-i-Khatun may be as old as the date of Taimur, that is about the 14th century. Buildings of burnt brick are the exception to-day, and I believe have always been the exception, in that part of the world. This was exemplified in a very marked manner by the almost total absence of ruins. All the way from Tehran to Sarrakhs, a distance of at least 600 miles, with the exception of one or two brick minars which date since the "Arab Conquest," or the Mohammedan period, we saw nothing but the remains of mud structures. Where old towns or cities stood all that remain are mounds.

The architecture of Persia at the present day is at a very low ebb; and to this statement it might be added that everything in that country has come down to the very lowest condition. It is nothing new to find, when a nation has fallen politically to an impoverished state, that architecture and the arts have also sunk with everything around them. Persia in former times stood high as a power, and must have also stood high in the arts. At Baku on the Caspian, which was a Persian town till the beginning of this century, I saw a building in stone, with rich and beautiful cut ornament upon it,[19] so fine in every way that I have seen no Mohammedan work equal to it out of India, and very few of the Mohammedan remains of that country could be said to be superior. We have a good illustration of the estimation in which Persian architects were held early in the Mohammedan period, from the fact that they were employed at that time, along with the Greeks, in the building of mosques and other structures in Syria and Western Asia. A late publication[20] of the Palestine Pilgrim's Text Society presents us with a glimpse of one Persian architect who came to Syria, where he acquired celebrity in his profession. His name was Abu Bakr, and his date would be about the end of the 8th century. This reputation may have been based on work similar to what I saw at Baku, and I believe there are other fine remains of a similar kind in other parts of Persia; but I am inclined to believe it must also have been founded on a high development of a style which was principally constructed from what I have here defined as mud. Kiln-burnt bricks were undoubtedly used in Persia, but, in that part of the country which I passed over, building with mud and sun-dried bricks must have been the rule, and I came upon one or two examples which served to show to what perfection it might be carried. Stucco was used for details, but the mud walls were faced externally either with coloured glazed bricks or tiles; marbles I have no doubt were also used. It is only in a very dry climate that sun-dried bricks are possible; the material is cheap, and great thickness of wall is

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[19] I was told that this building went now by the name of the "Palais de Justice," but I am inclined to think it was a tomb. It stands close to the old Palace of the Khans, and there is another very fine building close to it, which is a tomb.—W. S.

[20] "Mukaddasi," or the Jerusalemite, the name given to the grandson of Abu Bakr, who wrote a description of Syria, including Palestine, which is very valuable from its account of the architecture.—W. S.

given. If the mud be covered with glazed tiles, a substantial structure, and one that is beautiful also if the art on the tiles be good, may be produced. This I believe was one of the styles, and it was essentially Mud Architecture which was practised in Persia, and one which was carried to great perfection in that country. How far her reputation for this peculiar architecture went I do not pretend to say, but it may have led to her fame in the fictile arts, for her coloured tiles are still celebrated. Persian pottery can be seen and judged of at South Kensington. That belongs to the past. Persia still builds with mud, and produces coloured tiles, but the architecture produced is not, judging from what I saw, likely to be famous.

I shall now give some account of the Mud architecture which I saw on our march eastward from Tehran.

About 100 miles from the Persian capital, we came to a place called Lasgird, where there is an old and a very remarkable specimen of mud building. It might be called a village in itself, but probably it was the arg or stronghold of a town [Illustn. xxiv.]. I made no measurements, but some approach to the size can be given, so as to convey an idea of the place, but it must be understood that figures here stated have no pretence to accuracy. You can imagine a circle made in the rudest way by heaping up mud; the diameter externally might be about 200 feet, with a thickness of perhaps about 30 feet. The mass is carried up all round to a height of 30 feet, when the solid wall ceases, and houses are formed on this base. The houses are not quite regular, but there are at least two storeys. There are rude balconies on the outside, made of roughly-cut branches of trees interlaced with twigs, and mud laid on; doors lead out to them, and I saw men, women, and children, as well as goats and sheep, on this frail means of communication, which is perfectly innocent of anything like a protective railing. There are similar balconies on the interior side, with mud stairs. The space in the centre of this circle is entirely filled up with arched chambers, all in mud, in which grain is stored, and in which the cattle could be driven in times of danger. There is one, if there be not two, wells within the enclosure. To this village there is only one entrance, the size of which I will give by stating that it has a door of stone 45 by 37 inches, and about 7½ inches thick; it is a very rude affair, but its primitive character may be judged by its having pivots on which it turns similar to those on the stone doors of the Hauran and in Palestine. To understand this very peculiar stronghold it is necessary to convey some slight glimpse of the state of the country. For a long time back the eastern frontiers of Persia have been liable to raids from the Turkomans. These raiders came at times in small and at times in large bodies; we were told that in some cases the numbers reached to thousands. They were all on horseback, and rapidity of movement was a necessary tactic. The main body kept clear of the villages, and small parties were detached; these approached the inhabited places under cover of hills or rising ground, and then made a swoop down, capturing whatever they could—men, women, children, or animals of any kind. The Turkomans could not besiege a place; if any booty was got, this was sent to the main body, and the raiders hurried off to the next village as fast as they could, in the hopes of surprising it before news of the danger could arrive. As many of the fields were at a distance from the village, towers

of refuge were erected, with a small hole through which one person could pass at a time. If the peaceful tiller of the soil could get up through this he was safe; if not, a dreadful journey over the deserts of Central Asia was before him, and he would be sold as a slave to the highest bidder in the bazaars of Khiva or Bokhara. Towers were also made on hills or high ground near the villages, in which men were placed on the look-out for raiders; on the slightest sign of such enemies muskets were fired to give warning to all, and a rush was then made for safety. The smallness of the door at Lasgird was not peculiar to that place [Illustn. xxiv.]; had large gates existed, the Turkomans on their swift horses might have entered the village with the fugitives. That this was the correct understanding of the case I saw illustrated in a very marked manner at one village, where the door had been reduced in size at two separate periods, and it was now so low that when I entered on foot I had slightly to bow my head; a man on horseback could not have possibly passed through such an opening. The stone doors here find their explanation also; had they been of wood it might have been worth the Turkomans' time to have waited and burnt them, for everything in the village would then have fallen into their hands. Where there are houses outside of the village, they are always surrounded with a high mud wall, and the only entrance has a small stone door, not above 3 by 2 feet; many of them, I believe, were smaller. This raiding system is now a thing of the past, it has been entirely stopped by the Russian occupation of Central Asia. It will give you some idea of Persia as a



governing power when I state that she was unable to put an end to it. Lasgird is 500 miles from the frontier, and only 100 miles from the capital, and raids came as far west as that place. The precautions which were formerly necessary will now soon disappear, and I consider myself lucky in having passed over the ground when I could still observe such peculiar constructive conditions.

The height of the solid wall of mud at Lasgird was wholly defensive in its object. I saw other villages raised up in a similar manner; but Lasgird was exceptional in its peculiar round form. If we believe the villagers, the place dates back to very near the Deluge, for they say that the "gird," which in Persian means circle or enclosure, was traced on the soil by Las, the son of Noah. This name was new to me, as I doubt not it will be to most Westerns; and I have tried to find traces of the name since my return, but the search has as yet been fruitless. There are a few other old places in Persia with the termination of "gird" in their names, and I have a suspicion that this form dates back to some time when the circle was considered the right thing for a fortification. We have not only the few places in Persia still bearing this name, but Ecbatana was round.[21] The other form being the square, which can be traced from Babylon, through Persia, through central Asia, to Peking; in the north of China all the towns are within square walls. The round form I should take at a guess to be the oldest, as it might have originated among early races who lived on hills, which they fortified round the tops; while, the square form would be natural to those who lived on plains such as Mesopotamia, or Central Asia. I do not express myself as having very definite opinions on this subject; I was struck by the two forms, and here call attention to the matter, for if further data could be procured it might lead to interesting results.

Mazinan, the first place we stopped at after crossing the present boundary of Khorassan, seems to have been one of some importance in the past, for, in addition to the inhabited town, there are the remains of two other towns which are deserted and in ruins. I paid a visit to one of these which was nearest our camp. Everything here was of mud. Near the centre there was a heaped-up mass,—what I suppose to have been the Arg,—the summit of which was covered with houses. I here copy my description of the place written at the time:—"It was with some difficulty that I "was able to climb up to the top, as the mound had been used as a quarry—a mud quarry "—of the building material of the region. The mass forming the mound was artificial, for "I found bits of red burnt bricks or vessels embedded in it. The top was a curious maze "of rooms, courts, stairs, and roofs; much of it in a tumble-down condition, and it was "rather difficult to find a way in places. From the superior finish of some of the rooms, "I concluded that a Governor or some important man had lived in this place of security, "but there were ruder additions, which showed that servants, or perhaps a more simple "kind of people, had in all probability used some parts of the place at a later time. The "solid mass of mud or earth was about 20 feet high, and the houses were above that; still "they were not all on the same level, for I went up and down short flights of steps. The "whole heap was of mud, or at least of sun-dried bricks. Here I found at least one illustra-

[21] Herodotus i. 98.—W. S.

"tion of what can be done with such material which, from the high finish it presented, was "rather a surprise to me. It was the best room in the place; the dimensions were small, "somewhere about 15 by 10 feet. The lines of this interior were all perfectly straight, "and at right angles to each other. The best houses in London are not more exact, or "more finished in the details, than what I found here. The mud must have been carefully "put on at first, but the high finish was produced by *Gatch*, or gypsum. There were very "handsome niches all round the walls; and the fireplace had been elaborate, but some "act of destruction had taken place, and the fragments lay on the floor where they had "fallen. The ornament was simple; there were some slight mouldings on the space "between the niches. Lines had been drawn into the gypsum, and an ornament had "been repeated by means of a stamp which had been pressed or imprinted when wet, "producing a raised pattern; the impression left was so clean and perfect, that it might "have been gilt, and it would have been quite equal to the work we have at home on "picture frames. The contrast between this highly finished interior, with what was out-"side was very striking."[22]

Although not exactly included in the title of this Paper, I may mention the fire-burnt brick minars we saw. I counted one at Semnan, two at Damghan, and one at Khosrugird—here is the word "gird" again in the name of an old place—a city standing about three or four miles west of the present Sabzawar. I believe this was a very large place in the past, and the minar is the only thing left of it. These Minars of course date no further back than the Mohammedan period. The bricks are built so as to produce various patterns by their projection, and verses from the Koran in Kufic character are produced by the same means upon them.

Nishapur is a large town of mud houses, and mud walls. There was an older town about two miles to the south of the present one; here there is a large square mound, originally the arg or citadel, and ridges are still visible which mark the line of the old walls. Near the arg is the tomb of Omar Khayam, the celebrated Persian poet.

Meshed is now the capital of Khorassan; it is called "Holy Meshed," and owes its importance to the tomb of the Imam Reza, the eighth Imam who died in A.D. 818, being within its walls. At that time Tus was the capital, and it was a city of note. As it was only sixteen miles from Meshed, I wanted on my return the following March to pay it a visit, but was told that nothing was now visible except the arg, which I suppose would now be a mound only. I believe that Tus was a place of some importance up to the sixteenth century, and this will show how rapidly a mud-built city can disappear. Meshed is surrounded by a mud wall, which is about three miles in circumference. In the centre of the city is the sacred shrine of the Imam, it is not permitted to any but the Faithful to pass within its limits. I managed to get a pretty close view from the top of a house; the dome over the tomb is of copper thickly gilt, and the tops of the two principal minarets are the same. Haroun-al-Rashed is said to be buried near to the Imam; the interior is described as being very richly decorated with gold, silver, alabaster, marble, and precious

[22] M. Place describes mud walls with arched roofs in Nineveh, and the whole was covered on the inside with stucco.—W. S.

stones, as well as with very beautiful tiles; and I was told that an older structure had stood there before, and that some of it still existed in the foundations, which were as old as Alexander, but I could not find out what learned archæologist it was who had been able to identify the masonry of Alexander's date. Traditions of the great Macedonian conqueror, it may be mentioned, are very common in these regions.

We were encamped in a garden without the walls, where I found a characteristic specimen of mud architecture; this was an old gateway, now partly in ruins. It was formed of massive walls of mud, covered with glazed tiles, in which blue and white predominated; but the art was of a very poor kind, whence I conclude that it was of no great antiquity. The arches were pointed, and the style of the gate might be said to be the same as those to be found all over Afghanistan, and somewhat similar,—but of course not to be compared to the gates of Delhi, Agra, and other places in India.

Between Meshed and Sarrakhs we found a desolated country. We were now, on leaving Meshed, nearing the frontier of Persia, and the raiding system had made it impossible for human beings to live there. We passed the remains of villages in various stages of ruin; in some the mud walls were standing, in others the mound condition had been reached. At Sarrakhs—there are two places of that name; new Sarrakhs is on the left bank of the Tejend.[23] It was built by the Persians, on their side of the frontier, for the accommodation of troops. The walls and houses within are wholly of



THE MESHED GATE, NEW SARRAKHS, CENTRAL ASIA.

mud. On the right hand of the river, which is now Russian territory, stands Old Sarrakhs. We need not doubt but this is a very ancient place, for it stands on the great highway from Persia to Merve, Bokara, Samarkand, and "far Kathay." The tradition is that Adam had his garden here, and that he came to work in it every morning from Serendib or Ceylon! Whatever may have been the age of the place, or its size in former times, there is little to be seen now but a square mound, each side of which may be about 300 feet, crested with some ruinous fragments of wall and tumble-down

[23] The Tejend is the same river as the Heri Rud, but it changes its name a few miles to the south of Sarrakhs.—W. S.

towers. I went up to the top of the mound, and found it covered with fire-burnt bricks, showing that there had been substantial houses on it at one time. All round this mound the ground undulated, but, as bushes and vegetation covered everything, it would have taken time, which I had not at my disposal, to determine the original extent of the place. There were some mud walls standing, which I presume formed the inhabited town, described by Burnes, when he passed through about fifty years ago. There is an old tomb on the south of the mound, of burnt brick, said to be the tomb of Abel. About a mile to the north-west of New Sarrakhs there is another, known as the tomb of Cain, also of burnt brick. I walked out to the latter, and made some sketches of it. It has a dome of a peculiar shape, being very flat on the top; and it reminded me of some of the earlier Mohammedan domes still to be seen about Delhi. The front of the tomb had been decorated with plaster, and the ornament was very fine; indeed, from what I had seen before, I might say it was unexpectedly beautiful. I could form no idea of the date of the work, but it was satisfactory evidence to me that good work had been done in that part of the world; and as stucco, or plaster made with it, was one of the materials used for decorating mud buildings, I have no doubt but that there must have been some very satisfactory results produced in this peculiar style of architecture.

From Sarrakhs we marched south along the Heri Rud to Kuhsan; the distance is about 140 miles, and Herat is only 60 miles further. With the exception of some habitations near to Sarrakhs we found the country a desert all the way to Kuhsan. It had once been fertile and populous, but it must have been for a long time past deserted, for most of the mud-built villages have disappeared; in many places there were no indications that human beings had lived there, except in slight traces of the old water-courses by which the fields had been irrigated. From Kuhsan we crossed over the ancient Badghiz to the Khushk River; this also had been fertile in former times, but now only a few remains of mud walls can be seen. We struck the Khushk Valley at Kara Tappah,[24] which is a large mound in the centre of the valley with ruined walls and towers of burnt brick on its summit; this mound was much higher than the one at Sarrakhs. There were some ruined mud walls at the base of the mound. Abbot passed Kara Tappah in 1839, and there were a few people there at that time. A hundred years ago the Khushk Valley was well peopled. About seventeen miles further down the valley is Kara Tappah Kurd, or the "Little Black Mound." This one is rectangular, but not exactly square, being about 120 by 100 yards. At the north-west corner there was a square mound standing higher than the large mound; it might be about 22 yards on the summit. There were no remains on this mound, scarcely a brick was to be seen, and it was so regular in its form, it looked as if only recently formed, and as if it had been carefully trimmed with the spade. There were

[24] Kara Tappah, or the "Black Mound;" *Tappah*, which varies to *Tepé*, is a common word in the East; many of the mounds of old Topes about Jellalabad were designated by this word. Tappah and Tope are said to be allied words. I gave a description of a Tope in a Paper on "Buddhist "Architecture in the Jellalabad Valley," TRANSACTIONS, 1879-80, pp. 45-46.—W. S.

XXIX. MUD ARCHITECTURE: NOTES MADE



LASGIRD, PERSIA, From a Sketch in Indian

[Pages 5

PERSIA AND OTHER COUNTRIES. (xxiv.)



The Phototype Co., 303, Strand, London.

by WILLIAM SIMPSON, R.I., *Hon. Associate.*

evidences that a town had at one time existed round this mound, but it was difficult to say to what extent, as the ground was all covered with vegetation.

Kala-i-Maur[25] has been an important place in the past; the undulations left by the ruins of the town extend to some distance round the Tappah which had formed the Arg. This mound is now slightly irregular, but I suppose it to have been originally square. A small ruined fort of burnt bricks is now standing. I had guessed that the walls at Sarrakhs and Kara Tappah, although old and decayed, might be still more modern than the mounds they stood upon; at Kala-i-Maur this became evident. In this case the plan of the fort had no reference to the plan of the mound, and the variety of bricks upon it showed that it had been built out of older materials.[26]

Near the junction of the Khushk and the Murghab stands Ak Tappah, or the "White "Mound," by far the largest mound that we saw, and, roughly speaking, triangular in form. Its greatest length is about 300 yards, its greatest width is about 100 yards, and the whole is about 100 feet high. At the time of our visit the Afghans had run a mud parapet round the top, but otherwise it was a bare hill. The ground all round was mixed with fragments of pottery, but that was the only evidence of the previous existence of a town. We went south on the left bank of the Murghab, and not far from Ak Tappah we saw mounds, in which were fragments of pottery; these continued to Penjdeh, over a distance of about four or five miles, showing that there had been habitations over all this space. At Penjdeh there are the remains of a fort, nearly all in the mound condition. On the right bank we could see the mud walls of a town in ruins, and I learned that there were miles of mounds there, marking where a town, or it may have been a succession of towns, formerly stood. The remains of mud towns will be, I fear, rather difficult data upon which to found dates; careful explorations may do something, but a passing traveller could form no idea. A mound might be a hundred years old, or a thousand, or even two or three thousand years old, and externally there might not be a vestige of anything visible to give a hint as to time. The Murghab Valley was formerly very fruitful, but now, like other parts of this region, it is a desert. We have notices of it as far back as the old Zend books, where the Marv river, the old name of the Murghab, is called "a glorious river in "the east,"[27] and the vast quantities of mounds along its banks are still evidences of its former prosperity.

The land from Penjdeh to Maruchak, a distance of twenty miles, is covered with remains. Maruchak is an ancient place, with one of these old mounds, forming an Arg; while around it is a mud wall enclosing what had once been a town, of which scarce a

[25] This name means the Fort or castle of Merve, Maur being the old form of Merve; the Sultan Sanjar made it his capital, and probably assumed the name for his place for the sake of prestige.—W. S.

[26] The sizes of these burnt bricks may be worth giving. The largest bricks were 11¾ inches, another was 10¾ inches; these were square. There was a smaller size, but I did not measure it; it may have been about 8 inches. They varied in thickness from 2½ to 1½ inches. There was an oblong brick about 7½ inches long and about 1½ inches thick. Nearly all these were reddish in colour, but there were a few of a dull yellow tint. I noticed some of these yellow bricks at Sarrakhs.—W. S.

[27] *Bundahis*, xx, 21. *Sacred Books of the East*, vol. v.—W. S.

vestige now stands. This mud wall, though now old and in a ruinous condition, may be very modern in comparison to the Arg. For some distance outside there are mounds, at present almost hid with vegetation, telling that this had once been a place of considerable size. From Maruchak to Bala Murghab, about twenty miles distant, we passed one or two smaller mounds of Args. At Bala Murghab there is an old Arg, which has been lately made into a fort by the Afghans; and there are mud houses in considerable numbers about it in various conditions of decay.

I may mention that we saw some bridges, mostly ruined, built with burnt bricks, and that excavated caves exist in various places; but these do not exactly belong to the subject of the Paper. I have here given a slight sketch of the region, and of the remains upon it, as these were principally formed of mud. These old Args, whatever may be their date, were mud fortifications. The towns and villages we saw the remains of were nearly all constructed of mud. I have mentioned burnt bricks, as their existence is evidence that some buildings had been an exception to the general rule; but I think that these exceptions must have been rare. I take it that the use of glazed tiles externally, and of stucco or plaster for internal decoration, would, with mud walls, permit of not only substantial but, at the same time, of beautiful structures. Among the earth of the mounds I saw innumerable fragments of pottery, much of it glazed with the most delicate tints of blue, green and yellow; these tints would, no doubt, be also used on the tiles for buildings, and they suggested how artistically a mud building may have been ornamented. Mosques, tombs, and other important buildings would be in this style; but the mass of the houses were without decoration. The mud villages I saw before we reached the frontier, where all has been destroyed, would be the common type everywhere. In the great plain of Central Asia stone is scarce, and on that account mud was necessarily the principal building material.

I managed to pick up a few details of the manner of building in Persia with mud, which I shall now give.

In good houses foundations are made, from two to three, or even four, feet in depth, with rough uncut stones, if they can be procured, or burnt bricks; and filled up with mud and lime. Such a foundation is carried up a foot or so, and at times more, above the surface of the ground.[28] In the better class of houses where underground cellars are required, these are always of burnt brick. Walls are from two to four feet in thickness, but this all depends on the quality of the house and the means of the builder. The thicker the wall, the cooler the house will be. Where there are bala-khanehs, or upper rooms, the walls have to be all the stronger below. Where stones or burnt bricks are not to be found, this, of course, has to be omitted; but I noticed that even in poor villages the houses had a base of rude stones, and upon that the mud is laid in a layer of two or three feet; for, if more were attempted, the weight of the soft mud would cause the wall to bulge out below, and the whole would tumble down. A day or two has to pass while it dries, before another layer can be laid on, and on common walls the lines of these layers can be easily traced. This is the simplest mode of building, but it is slow. With the

[28] This base of bricks, stones, &c., is by the Persians called Eezar, an old Arabic word for *Trowsers*.—W. S.

mud formed into bricks the building can go on continuously. It is not uncommon to build by both methods; and often the lower part of a wall is made with layers of mud, and the upper part with bricks. In Persia sun-dried bricks are generally made about 8 inches square and 2 inches thick.[29] In using bricks for the upper portions of walls, they are often laid at an angle, so as to produce zig-zag patterns by way of ornament. In garden walls, and I think I saw the same in town walls, bricks are placed perpendicularly, one on the outside, and one on the inside, with another on the top like a lintol, thus leaving a hollow space between. By means of a course or two of this kind, weight is avoided on the upper part of the wall,—a manner of building which is called *Sanduk*, a word meaning a "box," from the square form of the hollow space which is left.

There is one peculiar result of mud building, which appears most marked in towns where houses stand near to each other: to avoid the expense of bringing earth in from the country, the ground where the house stands, and the bit of garden behind, is used for the building, this lowers the level, and you have generally in a crowded town to descend a few steps when you enter.

To preserve the mud wall from the action of the rain, a mixture of mud and chopped straw, called *kahgill*,[30] is used. A coating of this is put on; and it ought to be repeated on roofs every two years, and on the walls perhaps every five or six years. I was told of mud walls in Ispahan which were more than 300 or 400 years old. This is a good long time, but we may suppose that there would be a good deal of patching, for laying on new mud, where a repair is wanted, cannot be a very expensive operation.

In Indian villages the mud houses stand on a *chabootra*, or raised platform of earth, the height of which is about a couple of feet or so, extending for some distance in front; and on this most of the domestic operations are performed. The whole floor of the house, as well as the chabootra, is washed over at regular intervals, almost every morning, if I recollect

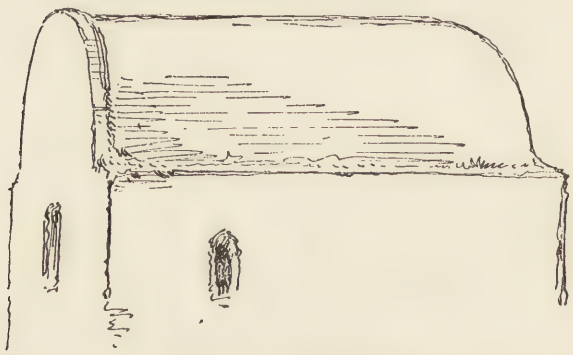
Mud-built Houses, Village of Sivah, Khorassan.



[29] Sun-dried bricks are called *khest;* while *ajur*, or *aujur* is the word for burnt-brick. In Afghanistan *khist* is used both for sun-dried and burnt-brick. MM. Perrot and Chipiez state (*Assyrie*, vol. ii., pp. 115-17) that in Mesopotamia the old bricks were from 15¼ to 15½ inches square, and their thickness was from 2 to 4 inches. It is stated that there is a brick in the Louvre 17½ inches square. The Babylonian bricks were, as a rule, one Chaldean foot [rather more than an English foot] square, and 4 inches thick.—W. S.

[30] *Gill* = mud, and *kah* = to straw.—W. S.

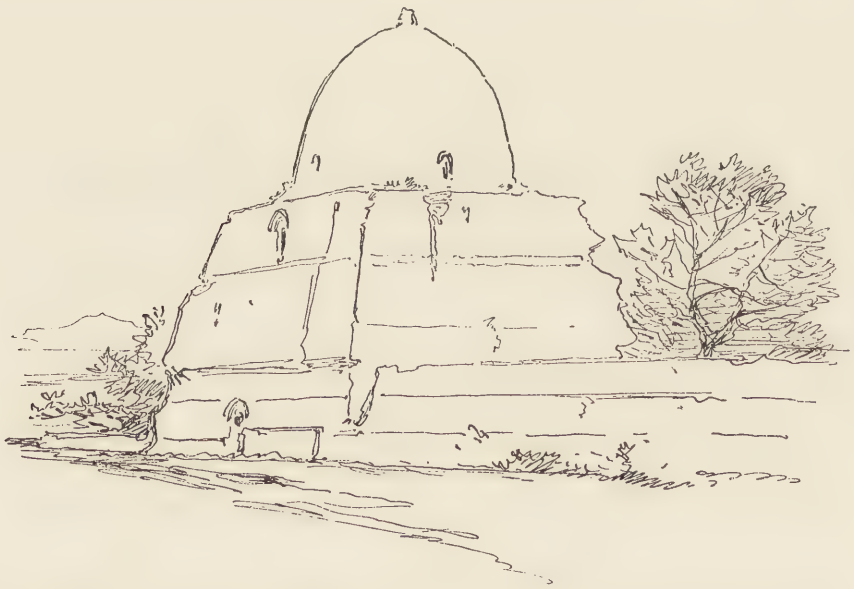
right, with a thin mixture of mud and cow dung. This is considered by the Hindus to be very clean and healthy.



Vaulted Roof of Sun-dried Bricks.

The mode of roofing depends upon circumstances. Where timber is to be found flat roofs covered with mud are used. I have seen roofs in villages made with very rude branches of trees and small twigs, over which was laid a slight coating of mud. In good houses where a substantial roof was required, and beams have to be used, there is great danger from the white ants.

In India,—I speak of Central India, Rajpootana, and the north west, including the Punjab, where almost all the villages are of mud—flat roofs are the rule; I do not remember to have ever seen an arched roof of sun-dried bricks. In Persia, wherever wood is scarce,—and large portions of the country are in this condition,—the arch is in use; and it is either in the form of a dome or of a barrel roof. The form of the arch is got by laying stucco in a wet condition on the ground, and with a string fixed at one end as a centre, the other gives the curve over the stucco, a narrow strip of which is thus



Mosque (or perhaps Tomb) at Razeeabad, near Sabzawar, Khorassan.

cut out, and when dried it is fixed up as a guide for the curve of the arch. I was told that arches could be put up without centres. My informant had been some years in the country, and I had no reason to doubt his word. Gatch, or gypsum, is plentiful, and the mud bricks are stuck together with this. I should suppose that some support would be

used, which could be contrived in various ways.[31] In large arches, and in all good houses, where regularity of form is important, centres I understood were employed.

The bricks of an arch or of a dome, I noticed, were placed, I might say, as you would put volumes on a book-shelf, that is, laid with their largest surfaces in contact. This no doubt helped to give greater holding power. Often, the bricks, I speak of burnt and unburnt bricks, seemed to be placed almost "anyhow," for they were most roughly put together; but I noticed they had great facility with domes and arches. Where small arches came in contact with larger ones, or where domes met barrel arches, they were joined into each other without the slightest difficulty. It seemed to be all done anyhow. I have no doubt but that it was all done by rule of thumb; and yet there must have been method in it. Were such a thing to take place in Europe, the result would be learned Papers on the angles, the form of the bricks, and the conic sections involved in the operation.

My interest in the mud buildings of Persia began very early after my arrival in that country. The cause which so soon fixed my attention upon it occurred when I



PERSIAN MUD VILLAGE.

had been only a day or so in the land. On the journey from Resht to Tehran, the morning that I crossed over the range of the Elburz, the road descended down on the plain where the old City of Kazvin stands. It was in the early morning when I reached some old mud walls, the ruins of villages. I gazed on them with some slight wonder; the notion came over me that I must have been spirited away during the night, and that I had wakened up in Afghanistan. In the late Afghan War, in 1878-79, when I accom-

[31] That this is possible, I give the following statement by MM. Perrot and Chipiez.—"We may refer "those who are specially interested in constructive methods to M. Place's account of the curious fashion "in which the workmen of Mossoul will build a pointed vault without the help of any of those wooden "centerings in use in Europe. In our day, certainly, the masons of Mossoul use stone and mortar, but "their example none the less proves that similar results may once have been obtained in different "materials. A vault launched into mid-air without any centering, and bearing the workmen who were "building it on its unfinished flanks, was a phenomenon calculated to astonish an architect." Rich describes a similar method in Bagdad. It is also affirmed that the Byzantine architects produced arches without the aid of centres. M. Place (*Ninive et l'Assyrie*, vol. i., pp. 266-7) describes one method of making vaults without centres, which he saw in Kurdistan; and in this case it was women who performed the operation. They placed rings of dried clay, each smaller than the other, till the dome was completed.—W. S.

panied Sir Sam. Browne's Column through the Khyber to Jellalabad,[32] and on to Gundamuck, and to which I had been attached for over six months, I had become tolerably familiar with the appearance of Afghan villages. They might be described, in military language, as four bastions with a curtain between each; or an ordinary description might say, four walls with a tower at each corner and a gate to the village in one of the walls. The ruins of the first village I had come upon in the Kazvin Valley were still sufficiently complete to show its original form, and its resemblance to those in Afghanistan was very remarkable. It had the four towers, one at each corner, with the wall between, and the gate in the middle of one of them. The walls and towers were crenellated on the top, corresponding in this detail exactly with those in Afghanistan; the horizontal lines, indicating the layers of mud which had been laid on, were the same in both. As I went on to Kazvin I passed more of these villages—some in ruins and some inhabited. I may say that this is the style of village along the whole of the route we travelled over till we reached the Afghan frontier. This I had guessed would be the case. It struck me as a very important fact that a similar manner of construction in buildings should exist from very near the shores of the Caspian all the way to the banks of the Indus. It occurred to my mind that this might be valuable in its bearing on questions connected with the history and origin of architectural forms in the East. To the student of Indian architecture, the point, I think, is of great significance, merely as showing the possible migration of a manner of construction or of details in architecture. It is not many years ago since we became aware of what I may call the Greek influence which at one time travelled at least as far as the Indus: it came from Bactria, where it had been brought after the time of Alexander. From Kazvin to the Indus is a still greater space, and the knowledge that similarity of manner can be traced, although in such a primitive condition as the mud walls of a village, over that distance, will give greater confidence to anyone who may venture to theorise regarding the history of architectural forms by identifying those of India and Persia together. These were the thoughts which the mud villages of Persia suggested. We already know of forms in India which came from Persia, such as the Persepolitan bell-formed capital, which was common all over the greater part of India as early as the time of Asoka.[33] The late Mr. Fergusson had a theory that one of the forms of Dravidian architecture, peculiar more particularly to the south of India, might have had its origin in the terraced tower-temples of Mesopotamia. Theories of the kind must each depend principally on their own merits; still, theories of identification do help to support each other, and I may express a regret, which all will sympathise with, that Mr. Fergusson is no longer with us, for I know that he would have been much interested in the geographical extension of these mud villages.

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[32] See Mr. Simpson's Paper (TRANSACTIONS, 1879-80, pp. 37-64) on "Buddhist Architecture in the "Jellalabad Valley."

[33] 250 B.C. We find this capital in all the remains of this date, so that it must have been in India for a considerable period before. Mr. Fergusson was inclined to believe that it was not introduced, but was "common to both countries."—W. S.

While I am on this part of the subject I may mention an extension of architecture that I met with in this journey, and which came in the opposite direction. On the Heri Rud, which is the present Persian frontier, I saw some caves on the other side of the river, about twenty miles south from Sarrakhs. I could not get up to them to see what they were like, but we saw caves on the Murghab, of which there is rather an extensive and remarkable group at Penjdeh. So far as our knowledge goes, my impression is that all these excavations are Buddhist, and, if so, they are derived from the rock-cut temples of India, and were made by the Buddhist monks. At Jellalabad I made sketches, with plans and sections, of the caves in that valley. Now there is no doubt but that they were Buddhist, and we have no other way of explaining the origin of those on the north of the Paropamisus than that they were also the work of the same class of monks. We do know that Buddhism passed through Afghanistan to the Oxus, and went eastward to China, but how far its extension went westward is not yet known. The caves on the Murghab and the Heri Rud are important as evidence on this subject.

In the journey through Persia I noticed that larger villages had an extra tower, perhaps on two sides, and in some cases on all the four sides. Large towns were passed on the route, such as Sabzawur, Nishapur, and Meshed; and the walls round these places were simply an extension of a similar wall to that of the villages, and a further repetition of the towers. In some places, as at Nishapur, I saw these walls tumbling



THE DURWAZA MEHERABAD, NISHAPUR, KHORASSAN.

into decay, while in others they were quite new; in one place I saw a wall of this kind being built. I mention it as it brings this style of wall down to the present moment.

Now, let any one recall the Assyrian sculptures in the British Museum, or the repre-

sentations in books of Mesopotamian walls of defence, and it will bring to mind crenellated walls with towers at regular intervals, each sculpture or representation giving in every case what seems to be exactly the same wall and the same towers. We know that these Mesopotamian walls and towers were all constructed of mud, and they are in almost every detail the complete counterpart of the walls of defence, such as I saw only two years ago being made in Persia. I confess that I felt some wonder and surprise when this identification first dawned upon me; the identification includes a long period of time, as well as a large geographical space. Such walls have existed in Mesopotamia for thousands of years; they are so simple and primitive that it is hard to suggest a date too early for them. We may presume that they also existed in Persia and in Central Asia from the most primitive times. The Shah-Nameh dates mud building as far back as the time of Jemshid, a mythical personage, which is old enough. Of him it says:—"He taught the unholy Demon train to "mingle water and clay, with which, formed into bricks, the walls were built, and then "high turrets, towers, and balconies, and roofs, to keep out rain, and cold and sunshine." From the Euphrates by the line through Persia to Central Asia, and then south through Afghanistan to the Indus, is a considerable distance, yet that is the ground over which this defensive manner of construction extended.[34]

I was led to the conclusion that there is one principle in architecture which may be traced back to mud building. As in botany all flowering plants can be reduced to two classes, so architecture may be brought down to an equally simple division of its elementary conditions, which would be trabeate and arched construction. For a long time the Romans were credited with the invention of the arch; but now no one would venture on a date to its first introduction. It has been found in two countries whose ancient remains are the oldest in the world: Egypt and Mesopotamia—two countries in which mud has been from the earliest times the principal building material. It was easy with mud, or sun-dried bricks, to erect walls; but in a hot climate a protection from the sun would be much needed, and the desire would be great to cover over the space between. If wood was scarce, and we are told it was so in Mesopotamia,[35] very early efforts must have been made to do it with mud or bricks. The old maternal necessity must have led to the invention and, consequently, even a rude savage may have solved the problem. Small spaces could be easily covered, and this must have led to success with the larger. I should be inclined to the idea that the arch is all but coeval with mud building; as a matter of fact it is so old in Egypt that its first invention is lost in the past. Its antiquity is thus clear, and so far we can speak with certainty, that it was in those regions where wood was scarce, and mud plentiful, that it came into existence.

[34] The portion of the Afghan Boundary Commission coming from India marched north by the western side of Afghanistan, which brought them through Seistan, now a ruined region, but which was at one time fertile and populous; it is covered with great mounds and remains of towns in which mud had been the principal building material.—W. S.

[35] "All the houses are vaulted on account of the want of timber." *Strabo*, B. xvi., c. i. 5. See also *ibid*, B. xv., c. iii. 10.—W. S.

There is another origin in architecture which must have been an early development where walls were made of mud. I have not studied the dado, nor do I know where it first had its birth, but it is a very old institution in Persia and Mesopotamia. In describing how mud walls are built it was mentioned that stones, or kiln-burnt bricks, were placed in the foundations, and that these extended for a foot or two above the ground. Here is the beginning of the dado. The stones were to prevent the wall from being worn away near the surface of the ground by water or friction of any kind. In the interior of houses there was a similar necessity; in the east the people sit on a carpet, and if there is a wall they place their back upon it, this would act slowly by rubbing, but would tell in time. In palaces, and important public buildings, where people frequented in large numbers, mud walls would require protection, and this explains the large slabs which were fixed against the lower part of the walls in the palaces of Assyria; in which case we have a high development of the dado, where the large slabs of marble were elaborated with sculpture. Still it was only a direct evolution from the simple mud wall of primitive times, which required protection along its base. At Tehran I accompanied Sir Peter Lumsden on a visit to the Nayeb el Sultaneh, a son of the Shah, and in the room where we were received I noticed a dado of very rich coloured slabs of alabaster; we sat on chairs during our visit, but I saw the utility of the dado by supposing we had all been Orientals sitting on cushions.

Up to the present we have almost exclusively confined our investigation regarding the origin of architectural forms to early wooden construction. We have forgotten that there was at least one other material which is as old and primitive in its use as timber. The savage who found himself on the muddy banks of a river, where there were no trees, must have very soon began to utilise the only means at his disposal. The primitive man, who first began to construct a shelter for himself and his family from the boughs of trees, could not have been long in advance of the other one, who raised a mud wall: probably for the double object of a protection from the sun, and as a defence from his enemies. When we consider that wooden construction implies the use of a knife, or of a stone hatchet, before any progress, except the very rudest, could be made; and that mud required no such advance in machinery, the hands only being enough for the work, it might be urged that this last process of building may have been the most likely to make progress in far-back ages. The oldest civilisations that we know of were in Egypt and Mesopotamia, two countries where mud-building has existed from the earliest times, and where it is still the mode of building.

I shall now give a very slight sketch of the extent to which mud building has existed; the sketch must not be looked upon as exhaustive, still it will give a faint idea of its having been common to almost every country of the world. As already stated, from far-distant ages down to the present the great mass of the population of Egypt have been housed in this way;[36] and though I have never been on the Euphrates

[36] Sir Gardner Wilkinson states in his *Ancient Egyptians*, new edition, vol. i. p. 342, that,—"The "use of crude brick, baked in the sun, was universal in Upper and Lower Egypt, both for public and "private buildings; and the brick-field gave abundant occupation to numerous labourers throughout the

or the Tigris, I presume the same may be said of that region. I have in this Paper described so far the use of this material in Persia, Central Asia, Afghanistan and India.[37] In the southern parts of India wood is more plentiful, and mud walls do not form the rule. The word Afghanistan here used might also include Seistan, Karman and Baluchistan. I have seen walls of mud brick in Tibet, and I believe they are not uncommon, for it is a region in most of which rain does not fall, and hence wood is scarce. Huc states that some of the houses in Lhasa were of mud;[38] and Prejevalsky, the Russian traveller, who went over some of Huc's ground in Tartary, mentions a town with a mud wall;[39] and he also states that he saw a part of the Great Wall of China, towards its western end, where it "was a mud wall, greatly dilapidated "by time."[40] This I think may be taken as evidence that this mode of building extended eastwards from Central Asia through the desert region to China. I have myself sketched the mud houses uncovered by Dr. Schliemann at Hissarlik; this brings us westward to Greece, which we associate in our minds with marble as a building material, or with Cyclopean masonry. There also I find that mud has been largely used, and it can be traced from a far-back period down to the present. Miss Yule, the authoress of Murray's *Handbook for Greece*, has called my attention to a paragraph in that work, which I shall take the liberty of quoting:—"In Attica a large proportion of the cottages, as well as of "the boundary walls of the olive grounds and vineyards, are built of 'cob' (the French "*pisé*), a term familiar to Devonshire ears. The Attic cob, however, differs considerably "from the Devonian, inasmuch as it is formed in large wooden frames about 4 feet long "by 2 deep and 1½ broad. In the best-built boundary walls due attention is paid to "that Devonshire adage which prescribes 'a good hat and a good pair of shoes' as 'all "'Cob wants.' In the generality of walls, however, the 'good pair of shoes,' viz. a stone "foundation, is omitted. Many of the Attic cob houses are half a century or more old, "and still as solid as when first built. This cob is of historic interest, as having consti- "tuted a somewhat important element in the military, probably also in the domestic, "architecture of Ancient Greece. Although Otfried Müller, in his valuable Memoir *On*

"country. These simple materials were found to be peculiarly suited to the climate; and the ease, "rapidity, and cheapness with which they were made, offered additional recommendations. Enclosures "of gardens or granaries, sacred circuits encompassing the courts of temples, walls of fortifications and "towns, dwelling-houses and tombs, in short, all but the temples themselves were of crude brick, either "with or without straw; and so great was the demand, that the Egyptian Government, observing the "profit which would accrue to the revenue from a monopoly of them, undertook to supply the public at "a moderate price, thus preventing all unauthorized persons from engaging in their manufacture; and, "in order more effectually to obtain their end, the seal of the king, or of some privileged person, was "stamped upon the bricks at the time they were made." In a note Sir Gardner adds that,—"Some small "temples in the villages were of crude brick." This quotation shows how extensive the use of mud has been in the Nile Valley. The Egyptian mud brick kindly lent by Mr. F. G. Hilton Price, F.S.A., on the evening when this Paper was read, had on it the cartouche of Thothmes III., thus illustrating what Sir Gardner Wilkinson states above.—W. S.

[37] In the north-west of India bungalows are built both with burnt and sun-dried bricks. The word *pucka*, or "cooked," is used for fire-burnt, and *cucha*, or "raw," is the term for sun-dried bricks.—W. S.

[38] *Travels in Tartary*, by Huc, vol. ii.-viii., p. 139.—W. S.

[39] *Mongolia*, by Lieut-Colonel N. Prejavalsky, vol. i. p. 242.—W. S. [40] *Ibid.*, vol. ii., p. 56.—W. S.

"*the Defences of Athens*, had clearly explained the true character of the ὠμὴν πλίνθον of "Pausanias, it was, we believe, Mr. Richard Ford who first pointed out its close affinity "to cob.[41] After whimsically maintaining that cob was introduced into Britain and "Greece by the Phœnicians, he continues:—'We cannot resist mentioning the ingenious "'manner in which Agesipolis, King of the Spartans, obtained possession of the city of "'Mantinea. He dammed up the river which flowed round the town, and then succeeded "'in softening the cob walls, which fell in. Xenophon, in his account of this affair, uses "'the expression πλινθων, while that of Pausanias is still more decisive of cob, ωμης, "'πλινθον. The Mantineans, when they rebuilt their walls, carried up the stone founda-"'tions of their new cob many feet, in order to prevent a recurrence of this stratagem. "'Cadmus, we suspect, used much *rad* and *dab* in the construction of Thebes. The "'principle of that nasty process is indicated by Thucydides in the works thrown up at "'the siege of the neighbouring Platæa.'"[42] *Rad* and *dab*, it may be explained, are Devonshire words used in connection with the making of cob walls.

It will thus be seen that in Greece, as far back as 385 B.C., the year in which Agesipolis took Mantinea, mud walls were used for defensive purposes, and most probably differing but little from those I have described as still to be seen in Persia; and that in Greece, in our own day, the villages and garden walls are also built of mud. Pausanias, in referring to the taking of Mantinea, says, regarding its walls, "though a "wall of this kind stands the shock of warlike engines, and is a better defence than a "wall of stone (for stones are broken in pieces, and leap from their places, through the "force of these engines), yet it is dissolved by water, no less than wax by the sun."[43] I quote this, as I think it shows that mud walls had, owing to the condition of military operations at that period, certain advantages belonging to them, and also to point out that those of Mantinea were not exceptional; their merits are spoken of as from experience, implying that they could not be confined to that particular city. We have confirmation of this in what Pausanias adds, that the stratagem used at Mantinea was not a new one, as it had been employed by Cimon, son of Miltiades, when he besieged Eion, near the river Strymon,[44] which is on the border between Macedonia and Thrace. It would seem that most translators of Greek works have used the word "brick," when they should have made it "crude-brick;" hence the extent to which mud was used by the ancient Greeks has not been quite understood. Here again I must quote from Murray's *Handbook*:—"It is rather curious that the full significance of the passages "alluded to above[45] seems to have escaped general attention; even Colonel Leake dis-"misses in a few words both the remarkable account by Thucydides of the operations "in Bœotia and the example afforded by Mantinea; moreover, he translates the Greek "word as sun-burnt or crude *brick*. The same term, *brick* (which if not positively wrong, "at least conveys a false impression to the English reader), reappears in all English "accounts of Greek walls with which we are acquainted—even in those ostensibly

[41] See his humorous essay "On Cob Walls," *Quarterly Review*, vol. lviii., 1837.—W. S.

[42] Murray's *Handbook, Greece: Ionian Islands, &c.*, part i., p. 145.—W. S.

[43] *Pausanias*, B. viii., c. viii. [44] *Ibid.* [45] This passage follows the one already quoted.—W. S.

"founded on Müller's Essay. We certainly do not dispute the occasional use in Greece "of real sun-burnt bricks such as are represented in the Egyptian paintings, but we wish "to guard against the common error of excluding *pisé* from among ancient Greek building "materials by those who nevertheless admit of its use in ancient times in Italy, Gaul, "Spain, etc."[46] *Pisé* is the laying on of the mud on the wall as described above by Miss Yule; and as sun-dried bricks were also used in Greece, and the two methods are still in use, it is an exactly similar condition of building to that which I have described in the further east. Note also the "good pair of shoes," by which the Devonshire people mean the foundation of stones on which they place their cob walls, and its identity with the same rule of building which I saw in Persia.[47]

The late explorations at Olympia revealed at one spot some data upon which a theory has been based, which, if correct, will add much to the importance of mud in relation to architecture in the past. When the Temple of Hera was discovered, a mass of earth was found in it, which at first was supposed to have been deposited by the river; but this turned out to be improbable. When this was cleared away the base of the walls of the cella were found standing; these were of marble, and about 3 or 4 feet high. The explanation which has been proposed is that the upper portion of the wall had been built of sun-dried bricks, and that the falling in of this had deposited the earth found in the temple; assuming this to be correct, Dr. Dörpfeld has pointed out the probability that in the early times, before marble came into use, the cella walls of Greek temples would be constructed of crude brick. That would be the period when the Doric was a veritable wooden order, and for some particular reason in this case the old manner of building had been retained. Pausanias mentions[48] that in his time one of the pillars was of wood—oak, he says—possibly one of the original which had chanced to be preserved. I believe that there has been some difference of opinion regarding this discovery, and I cannot pretend to be sufficiently acquainted with the details to pronounce any judgment of my own; but I submit that it is fitting at least to call attention to the subject in this Paper, as it implies that the origin of the Greek temple is as intimately connected with a mud as with a wooden origin.

In the time before Augustus found Rome built of brick and left it marble, sun-baked bricks were common in Italy. In Spain they were largely used; the villages of Andalusia are nearly all of this material, and in the south and west the walls of towns

[46] Murray's *Handbook: Greece, Ionian Islands, &c.*, part i., p. 146.

[47] Mr. W. Harry Rylands, F.S.A., has kindly sent me some references to mud walls in London, taken from Riley's *Memorials of London and London Life in the 13th, 14th and 15th Centuries.* The first is in the time of Edward I., 1293—"an earthen wall in the parish of St. Benedict Fynk . . . . . is a nuisance "to the King's highway in Fynkislane" (now Finch Lane), p. 30. Another reference is in Edward II's reign, 1320—"precept was given to the Chamberlain by the Mayor and Aldermen to take into the "hands of the City a small piece of ground, enclosed with an earthen wall, on the western side of "Crepelgate," p. 136. The last is as late as Edward III., 1337—"The said Richard (de Gaunt, *i.e.*, "Ghent, one of the Keepers of the Conduit) discharges himself as to 4*l.* 22*d.* for making a clay wall "about the head of the Conduit at Tyburne," p. 201. These quotations suggest that "cob" was not confined exclusively to Devonshire, and that mud may have been largely used in the early days of English history.—W. S.

[48] B. v., c. xvi.—W. S.

are often formed of mud. Probably the Moors may have helped to make this material more common than it might have otherwise been. According to Ford, the word applied to such walls in Spain is *tapia*.[49] The Spaniards carried this manner of building to America, and I have myself seen the old church of San Francisco, which gave the name to the present town, and it was built of sun-dried bricks.[50] In that part of the world, where earthquakes are common, this mode of building had a manifest advantage. The word used there for sun-dried bricks is *Adobes*, pronounced "Dobies;" this, I understood, was the Spanish word, but it will be noticed that it differs from that given by Ford.[51]

In many parts of the world "wattle-and-dab" is to be found; in this we have a combination in which mud forms a part. From having seen it, I can speak for its existence in Abyssinia;[52] and if I am not mistaken, some of the early Christian churches of our own country were constructed in this primitive way. I am indebted to the article in the *Quarterly* for the knowledge that in at least one part of England mud is a building material; and I would recommend every one to read that Paper, for it is not only very learned, but very amusing.

I have thus traced the existence of mud as a building material all the way from the Great Wall of China to San Francisco, including its use, under the name of "Cob," in our own country. I rather suspect that this wide extent, which I have only roughly gone over, is much greater than most people are aware of.[53]

The importance of the building material I have been dealing with may be illustrated by references to it in early mythology. A divine origin was generally given by the primitive religions to whatever was of high value to man: architecture, or building, on this account, as well as from the knowledge or wisdom which it required,

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[49] *Quarterly Review*, April 1837.—W. S

[50] This church dates from 1776, but in 1876, its centenary year, I think it was superseded by a more substantial structure.—W. S.

[51] The word *Adobes*, or *Dobies*, suggests a connection with the Arabic *Tob*, or *Toob*, which is evidently allied to *Tobi*, the Coptic, and also the ancient Egyptian, word for brick. The Spaniards most probably got this word from the Arabs.—W.S.

[52] See Mr. Simpson's Paper (TRANSACTIONS, 1868-69, p. 235) on "Abyssinian Church Architecture."

[53] See J. F. Blondel's *Cours d'Architecture Civile*, Paris, 1777, vol. v, p. 424, plate lxxxiv, fig. x. His editor, Patte, gives a full description of the mode of constructing buildings "*toute en terre dite pisé*," with an excellent illustration. He says "La bâtisse en pisé est fort en usage depuis très-long-tems dans "le Lyonnois, l'Auvergne, le Bourbonnois, le Dauphiné, la Principauté de Dombes, et les Provinces "circonvoisines. Le Pisé est une espèce de terre graveleuse très-commune dans ces endroits, et "susceptible de pouvoir être rendue assez compacte par l'art, pour ne point s'écraser sous les fardeaux. "Il est possible d'élever avec cette seule matière les murs d'une maison jusqu'à 2 étages, et de leur donner "une durée comparable à ceux bâtis en pierre . . . . . Ce genre de bâtisse est à la fois très-économique "et très-expéditif; il pourroit être employé avec avantage en bien des endroits où la pierre est rare, "d'autant que la terre graveleuse nécessaire pour l'opérer, est en général plus commune qu'on ne pense." In a small treatise written by F. de Cointereaux, a Professor in the École d'architecture rurale, and published in Paris in 1791, the author describes and illustrates a new kind of Pisé invented by himself. The same subject is treated by H. F. Rödlich, in a work published in Berlin, in 1829, entitled *Praktische und historische Darstellung der Erdbaukunst.* See also the article "Pisé" in the *Dictionary of Architecture* (Arch. Publication Soc.), vol. vi, p. 123, and the subsidiary articles on "Clay Walling," "Cob Walling," "Formaceum or Formarium opus," "Concrete Building," &c.

was supposed to be derived from the Deity. In some cases the workman is represented as receiving inspiration, while in others he assumes the form of a deified personage. In the Egyptian system we have Ptâh;[54] in the Greek, Hephaistes; and in the Brahminical, Viswa Karma.[55] I have already given a quotation from the Shah Nameh, which belongs to the mythic period, when Jemshid[56] taught the people how—

". . . . to mingle
" Water with clay, with which, formed into bricks,
" The walls were made."

Among the ancient fragments which have come down to us, and which are doubtfully ascribed Sanchoniathon, there is a reference which is equally distinct in giving a mythological origin to mud architecture. The writer, be it Sanchoniathon or otherwise, mentions Chrysor, whom he identifies with Vulcan,[57] who invented a great many useful things; and it is stated that, " Men worshipped him after his death as a God, and they " called him Diamichius—*i.e.*, the great inventor; and some say his brothers invented " the making of walls with bricks. After these things, of his race were born two young " men, one of whom was called Technites—*i.e.*, the Artist; the other, Geinos Autochton, " *i.e.*, earth-born, or generated from the earth itself. These men found out how to mix " stubble with the brick-earth, and to dry the bricks so made in the sun."[58]

Berosus ascribes to the fish-god, Oannes, a great many inventions; amongst others " he taught them to construct houses, to found temples, &c."[59] This deity appeared out of the Erythræan sea, or the Persian Gulf, near to Babylonia; having the locality thus given, we may be sure, although it is not stated, that the houses Oannes taught the people to construct would be formed of mud.

According to Professor Sayce,[60] the Assyrians had a month which was named the " month of bricks." The third month, Sivan, *Si-va-nu* or *Tsi-i-van* in Assyrian, was the month of bricks. The third month, if I mistake not, would correspond with our June; it would be a hot month, which will explain why it might be the particular season for

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[54] In the Trans. of the Soc. of Bib. Arch. vol. iii. p. 387, Mr. C. W. Goodwin, M.A., points out that Imhotep, or Imouthes, " Son of the primæval God Ptâh," was the inventor of architecture.—W. S.

[55] Viswa Karma, the " All Worker," was a burhai, or carpenter.—W. S.

[56] The name of Kaiomurs, the first of the old legendary kings of Persia, is said by Sir John Malcolm, in his *History of Persia*, "to be a Sanscrit word, and signifies 'body of clay.' He is termed Gil Shah, " or 'King of Clay,' by all Persian authors, which is evidently a translation of the term in the Zend-a- " vesta." " Gil " is the word, already given in this Paper, for the mud used to this day for building in Persia. *Hist. of Persia*, vol. I., chap. vii., p. 199, 4to. edition.—W. S.

[57] According to the Cosmogony of Sanchoniathon, all things were derived from mud. In some of the ancient systems God, as the Creator, is represented as an architect or builder. If the deity of Sanchoniathon could be shown to be of this character, it would be an interesting point; the identification of Chrysor with Vulcan, the " Divine Architect," goes far to establish this. The deification seems to have been determined by the building material of the locality. In Greece metal was largely used, and Vulcan was a worker in that substance. In India wood was employed, and Viswa Karma was a burhai or carpenter. I only put it as a suggestion, that this may throw light on the Mud Cosmogony of Sanchoniathon.—W. S.

[58] Corry's *Ancient Fragments*, p. 8, ed. 1876.

[59] Trans. of the Soc. of Bib. Arch., vol. iii., p. 162.

[60] *Ibid*, vol. iii., p. 57.—W. S.

making sun-dried bricks. That a month should be named from this occupation will show that it was one of no mean importance.

The Jews used the word לבנה, *Lebanah,* for a brick, whether dried in the sun or burnt; the word means "white," and is supposed to have been applied to it for the reason that the same word is used for the moon, from similarity of colour; but Sir Henry Rawlinson, in his *Herodotus,*[61] gives an explanation which would suggest that there may be more in this identity than is here expressed. He says that it embodies the notion of sin, the moon, as being the God of Architecture. This would be a point of some interest to have explained, as it would seem to show some symbolical relationship between a brick and a god of architecture; but it can only be done by a scholar who is perfectly familiar with Hebrew and Cuneiform writing.

About two years ago Dr. S. Louis read a Paper to the Society of Biblical Archæology, on *Handicrafts and Artizans mentioned in Talmudical Writings.* On the subject of builders, Dr. Louis points out a word, נדבך,[62] which commentators have explained as meaning "a row of bricks or stones;" but he quotes the great Rabbi Maimonides, who affirms that it means the wooden boards which were used in making mud walls. I quote the description of the process as given by Maimonides. "The builders take two "boards, about six cubits long and two cubits high, and place them parallel to each other "on their edges, as far apart as the thickness of the wall they wish to build; then they "steady these boards with pieces of wood, fastened with cords. The space between the "boards is then filled up with earth, which is beaten down firmly with hammers or "stampers; this is continued until the wall reaches the requisite height, and the boards "are then withdrawn." Maimonides lived in Spain, and this description is more likely to have been derived from seeing what Ford called cob walls, built in that country, than from the practice of the Jews in Palestine; still if he is right about the signification of the word, that it means the boards for building mud walls, the quotation may be of some value in relation to more ancient times.

I have still another illustration to give before this Paper is finished, but it is I think an interesting one, as it shows the mud brick as a symbol in connection with building. Mr. Flinders Petrie in his late explorations at Pharaoh's House in Taphanhes,[63] the Greek Daphnæ, now called by the Arabs Tell Defenneh, which was all formed of sun-dried bricks, came upon what might be called the "foundation stone;" but there was no stone, and it might be called the "foundation deposit," which would be a more accurate title. The objects found were gold, silver, alabaster, lapis lazuli, and other precious stones, pieces of lead and copper ore, &c., the stones used for grinding corn, and some of the remains of the sacrifice performed at the ceremony; among these, and occupying a very central position, was a small model of a mud brick.[64] Mr. Petrie tells me that he has found the

[61] Vol. i., p. 615; see also Smith's *Dict. of the Bible,* Art. "Moon."—W. S.

[62] Trans. of the Soc. of Bib. Arch., vol. viii., p. 409. Dr. Ginsberg tells me that this word may be pronounced something like Nidbak.—W. S.

[63] Jeremiah, xliii., 9.—W. S.

[64] See *The Illustrated London News,* for Sep. 11, 1886, where drawings of the objects, with their relative sizes and position, are given.—W. S.

same articles in other foundations, and he knows now where, when he is excavating, he is sure to come upon them in ancient Egyptian remains. It is evident that these objects were placed in foundations with an emblematic meaning. There is the sacrifice to represent Religion, there are the corn-grinding stones to express Life, a piece of green glazed ware with Pharaoh's name and title, as well as some of the other objects, which might symbolise Government; the pieces of metallic ore, as well as the gold and silver, would stand for Industry and Commerce, while the model mud brick represented Architecture. It may be mentioned that Mr. Petrie found the lower parts of the walls at Tell Defenneh in almost perfect order, the mud bricks in this case having thus endured since the time of the prophet Jeremiah.

In conclusion I would say that in a warm dry climate, where as a rule wood is scarce, mud is the cheapest material for constructing a house with, and it forms a good and comfortable residence. While writing this article I have met a lady who has lived in one of the Devonshire cob houses, but she did not speak of it as a desirable place to dwell in. From this I should say that, in a wet climate like ours, mud and its near relative wattle and dab are not at all suited; hence I need not think of urging in any way the adoption of this material. This Paper, as already explained, is the result of my late journey through Persia, where I saw almost nothing but mud houses; and it is written more with an archæological aim than with any other purpose, and principally to call attention to one of the most primitive modes of building, which seems to me to have been slightly overlooked by writers on architecture. The authoress of Murray's *Handbook for Greece*, as already given, points out that literary men have not descriminated between sun-dried and burnt bricks in their references to Greece, showing that the subject I have here treated deserves more attention than it has yet received.

WILLIAM SIMPSON.

XXX.

NOTES MADE DURING TOURS IN GREECE, 1881 AND 1884.

By Professor T. Hayter Lewis, F.S.A., *Past Vice-President.*

IT is just forty-five years since I first visited Greece, and rode round the Gulf of Corinth, north and south. Then there were scarcely any carriage roads except between Athens and Marathon, Nauplia, and Argos. Nearly all travelling elsewhere had to be done on horse or boat, and with caution against brigands. Corinth stood on its ancient site, hard by its famous columns; and Eleusis, Epidaurus, and Olympia lay buried, as they had been for centuries. In 1881 and 1884 I visited it again.[65] All had changed then. Corinth, utterly destroyed by an earthquake, had been rebuilt two miles away from its old site. Roads were being made in every direction, railways were in progress, the country was safe, and the old buried cities had been brought forth



[65] My various routes in 1842, 1881, and 1884 are shown in the map.—T. H. L.

again to the light of day. Athens had been changed from the likeness of a large village to an important town, with public buildings so admirable in design as to be no unworthy successors to those of the ancient Greeks. But I shall say no more of my experiences in 1842, and confine myself to describing what I saw of the excavations in 1881 and 1884. Of these excavations I shall also confine myself for the most part to a general description, with details of the remains more especially interesting to architects. What has been uncovered has been described and illustrated by the Greek and German Archæological Societies, and also, from time to time, in various journals. Mr. Murray's new edition of *Greece* gives an excellent abstract of the results of the several excavations, with references to the various authorities to be consulted.

My first illustration is of a very remarkable tomb at Menidi, near Athens, excavated in 1879 by the German Archæological Institute, but so little known that in my visit two years afterwards I should probably have missed it, had it not been for the kind reminder of Mr. Murray of the British Museum. It is a circular tomb in the familiar bee-hive form so well known in Western Europe, and as may be seen on a small scale in Dartmoor, or on a large scale in Ireland at New Grange. It more nearly resembles the tombs or treasuries at Mycenæ, being completely underground and approached as they are, and as New Grange is, by a long subterranean entrance [Illustn. xxv.]. So completely was it buried that its existence was unsuspected until recently, although close to Athens and near the famous Colonos. It is about 27 feet in diameter and 28 feet high, the courses of stone not radiating but having horizontal beds like every other building of the same type known to me. I have drawn the one at Mycenæ to the same scale as that at Menidi, the latter of which is of comparatively rude construction, its stonework (A) being in general little more than very large rubble work, whereas the masonry at Mycenæ (B) is of first-rate character. Nevertheless, I must mention that the manner in which the great lintol stone at Menidi is worked shows that its masons could have done much better work if they had had more time or, perhaps, better pay. There is one feature, however, about this tomb to which I particularly wish to call attention, viz., the masonry over the entrance doorway (C), which at once brings to mind the peculiar construction of the work over the king's chamber in the Great Pyramid. To show it more clearly I have drawn this, but, on account of its great size, to a smaller scale than the Menidi one. The resemblance is striking. We turn to the objects found at Menidi to give us some clue as to the date, and we find there gold ornaments, bronzes, and ivories, amongst them being the carving of a pillar with traces of animals much like the well known carving over the Lion's Gate at Mycenæ. The German discoverers assigned the Menidi tomb to the 10th and 11th cent. B.C.; but this date, though hundreds of years more ancient than the first definitely fixed historical point, the first Olympiad 776 B.C., is almost modern as compared with the most moderate accepted date for the Great Pyramid. Was the Menidi construction then re-invented by the Lycians or Carians of Asia Minor, so as to let us have the same singular form used independently by two separate races, or is the later form a tradition of the elder after a lapse of centuries? I confess that I never could quite understand the principle on

which these successive lintols were erected. Something like them is to be seen in Chinese work, but in that there is a slight projection of the solid wall over each lintol in succession, thereby reducing very materially the bearing of the top lintol. The same principle of gradually lessening the bearing at top is carried out also by oversailing courses in all the great openings at Mycenæ (D); but at Egypt and Menidi the top lintol has just the same bearing, and, except in a slight difference of the weight to be borne, precisely the same weakness as though the under lintols did not exist. I suppose that the architect considered that, if the top one were broken, its two pieces would tilt down and be stopped by the next; or if that were broken, by the under one, the stonework above being wedged together into a solid mass as it followed. Against the fracture of the top lintol the Egyptians guarded by the powerful skeleton arch over it, but this the Menidi men omitted. Yet in two places, and in such eras so wide apart, how can we account for this singular likeness in construction? I venture only to suggest that we have yet to find the missing link in Asia Minor; and just as we found a new school of art opened to us, not many years since, by Sir C. Fellowes, and as, quite recently, distinct traces of the Hittites have been found, so in that unexplored country there may be brought to light Egyptian work hitherto unknown. I may add that some work of a very ornamental character, which has been identified with Egyptian design, has been discovered by Dr. Schliemann in the Tholus at Orchomenos.

The annexed diagram refers to another structure which surprises one in passing through the old Athenian cemetery—the Cerameicus. This cemetery was buried deep



Tomb in the Cerameicus, Athens.

under a mass of *débris* when I first was at Athens. But this covering saved it from worse destroyers than time, and though it was partly uncovered and ravaged some

seventy years ago, and again in 1861, it was not fairly revealed until some ten years later; it now presents a most interesting collection of Athenian tombs of all kinds, from the sculptured bas-reliefs to the ordinary grave-stones. My drawing shows two of these ordinary memorials, the one on the right being one of the stele (a plain upright slab), and that on the left one of the curious but well-known vase-like form, the libellum. Both these are of white marble, and purely Greek; but between them comes another tomb of different material and altogether different form. It has, in fact, just the appearance of a dolmen, of somewhat unusual shape, having two chambers side by side, and another crosswise at the end. The total size is about 9 feet by 6 feet, measured outside, and it is built of rough stones, and covered with them also, there being no marks of tools upon them. It is just the rough sort of sepulchre which we should see without surprise on a Cornish moor or a Welsh hill, and as I have seen in Brittany and Algeria. It is, of course, possible that this curious structure may have been that of a tomb dug into the earth after the cemetery had itself been buried, and then itself afterwards dug out and brought to light, or it might be owing, as Mr. Penrose thinks, to the way in which an old tomb has been partly ruined. I merely draw your attention to it as a picturesque curiosity.

Now I come to pure Greek work, omitting further mention of Athens, inasmuch as few discoveries of importance, as compared with Eleusis and other places, have been made there lately. A full-size drawing of one of the statues recently found in the Acropolis was given by Mr. Murray in his recent Academy Lectures, and as Mr. Penrose is likely to make known in a short time some very interesting particulars relative to two at least of the most important buildings—viz., the Erechtheum and the Temple of Jupiter Olympius—I will not forestall him as to these. Near to Athens, on the road to Corinth, is Eleusis. The ruins of its famous Temple of Ceres were partly excavated by our Society of Dilettanti at the beginning of this century, and their researches (the best account of which was published in their second edition, 1833) revealed all that was known until the Athenian Archæological Society began their work in 1883. The first building shown on approaching from the village is the little Temple of Diana Propylæa, only about 24 feet by 16 feet internally, and of which only the foundations and pavement now remain, the whole of the building otherwise having been cleared away. But though small it presents several very interesting particulars. It is noted by the Society of Dilettanti as being the only variety known of the kind of temple described by Vitruvius (Lib. iii. c. i.) as "in Antis" (ναος ἐν παραστάσι)—*i.e.*, "with antæ or pilasters in front of the walls which enclose the "cell, with two columns between the antæ." In this case we find this arrangement both in front and in rear. Here, also, we find the very unusual plan of the antæ being of the full width on all three sides, whereas in Greek work generally the flanks of the antæ are almost invariably much more narrow than the fronts—at the Parthenon, Theseum, Propylæa, and Erechtheum as examples. I conceive this to have been done to get rid of the very massive effect which the full-sized antæ would have when seen angle-wise, being then half as wide again as the column; otherwise it would seem to be the most natural thing to have the antæ of the same size as the columns which stand

opposite to them. In the exterior of St. Paul's Sir C. Wren has scarcely ever shown the angle pilasters to their full width, on more than one of their faces, and I apprehend that this was for the same reason as I have suggested above. This is confirmed by the fact that in the internal piers, which are clearly shown to bear an immense weight, and at the outer angles of the west front, he has shown the pilasters of their full width on each side; and thereby given an appearance of massiveness and strength which were wanted there. Another interesting fact connected with this tiny little destroyed temple is its agreement with the theory of proportions so ably worked out for Professor Cockerell in his *Ægina and Bassæ* by Mr. W. Watkiss Lloyd.[66]

The next building is the Propylæum, built entirely of Pentelic marble, and nearly as a copy of the centre part of that at Athens. It was disinterred by the Society of Dilettanti, and is so well described in their report that I need not enter into details respecting it, except, perhaps, to point out that the carving of the Ionic capitals is so much coarser than the work generally of the prototype at Athens, as to suggest the idea that this Eleusis copy was either unfinished, or executed at a much later period than the Athenian portal. Then we pass through the gateway called the inner vestibule in which, no doubt, some of the initiatory ceremonies took place. This is, apparently, a reconstruction in Roman times, and is also well described by the Society—their report giving some very interesting details as to the machinery probably employed to produce some of the mysterious appearances, which evidently deeply impressed the initiated.

Passing through its gates, we stand at once before the remains [Illustn. xxvi.] of the great Temple of Ceres, a building, exclusive of the portico, of somewhat less than 170 feet square, *i.e.* about two-thirds the length of Westminster Hall (239·3), and two-and-a-half times its breadth (68·0); or, to give a nearer illustration, it is rather more than twice the area of our Royal Exchange, which is 116·0 by 111·0. The general outline was ascertained by the excavations of the Society of Dilettanti, and we may safely take their plan, published in 1833, as the foundation for our present purpose; but recent excavations have shown their conclusions to be erroneous in several important points. The whole edifice was thrown down by, no doubt, an earthquake, and is one mass of ruins, even the great marble columns, 6·7 diameter, being broken at every joint. The temple was built on the side of a steep hill, which was cut into terraces, the higher of which would quite overlook the temple itself, if it were not covered in. Quite exceptionally, the angles and not the sides face the cardinal points of the compass. The Society's work was hampered, owing to the chief part of the site having been occupied as a village, whereas now, the houses have been cleared away and the greater part of the area exposed. It is now found that the excavation which the Society of Dilettanti made through the centre of the building, happened to be at one of the places in which the rows of seats had been broken away; and the Society of Dilettanti, finding the rock rough there, concluded

[66] The carefully elaborated drawings and calculations made by Mr. W. Watkiss Lloyd, F.S.A., of the proportions which he found to exist in the temple referred to at Eleusis were lent for the purposes of this Paper, to the discussion of which he contributed (see *Journal of* PROCEEDINGS, vol. iii. N. S., p. 172). Nothing short of giving Mr. Lloyd's work in its entirety would allow of its being understood.

that it had been left so originally. But it must now be evident that the lower storey was the scene of some of the most important of the rites, because the rock, except in that particular part which the Society happened to have cut into, was worked carefully into rows of seats, covered no doubt originally with marble. I saw these seats on the side next the rock, and partially on the two return sides. The part towards the portico was quite exposed at the time of my visit, but I did not see near there any trace of steps, nor of the central columns. These are of great importance in considering the theories as to the general design of the temple, and I have inserted them on my plan, because it appears on the one authorized by the Athenian Archæological Society. The part in the east corner, within the dotted lines, shows the site of the ancient temple which was burnt by the Persians. More to the south are remains of a still more ancient building, facing to the cardinal points. The positions of the columns of the portico are well defined by the marks which they have left on the pavement, and the mouldings of many of the Doric capitals are now easily seen in a perfect state, though all have been thrown to the ground and mixed up with the broken shafts. The view from this portico is now very startling, inasmuch as the excavations have removed the whole of the terrace shown on the plan in front of it, and the top steps of the portico, still left, lead abruptly to a perpendicular descent of 15 to 20 feet, the ground at the foot presenting a confused mass of walls of all ages. At the west corner of the main building, a somewhat complicated series of steps leads up to the first platform, as does a smaller flight at the north corner. This temple is, I need scarcely say, one of the most celebrated of the buildings of antiquity, and yet we have scarcely any description of it, owing to the dread of incurring the anger of its deity by revealing any of its secrets.

The earliest writer on the subject is probably our Vitruvius, who, it is supposed by Gwilt, completed his work about 25 B.C. He says in his introduction to Book VII, where he describes four temples only as being embellished with work in marble—"the third is "the Doric Temple of Ceres and Proserpine at Eleusis, the cell of which was built by "Ictinus of extraordinary dimensions for the greater convenience of the sacrifices, and "without an exterior colonnade. This structure when Demetrius Phalereus (D. 282 B.C.) "governed Athens was turned by Philus into a prostyle temple with columns in front, "and by thus enlarging the vestibule he not only provided accommodation for the "noviciates, but gave great dignity to its appearance."

Strabo, who lived in the first years of our era (54 B.C.–24 A.D.), is the next author who gives us any idea of the temple. He says (Book ix. c. i.):—"The Temple of the "Eleusinian Ceres and the mystic enclosure (Σηκος) which Ictinus built is capable of "containing the crowd of a theatre. It was this person who built the Parthenon in the "Acropolis." Pausanias, who wrote in the time of the Antonines, *circa* A.D. 170, says (*Attica*, Lib. i. c. xxxviii.) that he had been forbidden in a dream to write of the things within the wall of the sacred edifice. To the uninitiated it was not even permitted to make inquiries respecting them.

More details are given by Plutarch (*circa* A.D. 100) in his life of Pericles. He says that "the chapel where the mysteries were celebrated was begun by Corœbus, who

"erected the pillars that stand upon the floor, and joined them to the architraves. "After his death, Metagenes of Xypete added the entablature and the upper line of "columns." All translators agree that Xenocles of Cholargus roofed, or domed, or arched, or completed in some other way, the top; but in *what* way they differ.

In the above description there are also two distinct and positive, yet apparently discordant, accounts as to the original design of the whole building. Vitruvius says that it was by Ictinus, and Plutarch gives it to Corœbus. As these architects were almost contemporaries, I venture to suggest that the two statements may be fairly reconciled by considering that so famous a man as Ictinus may have given the design, much as a consulting architect might do now, it being carried out at first by Corœbus, and continued by Metagenes. But the rest of the matter is not so easily settled. In order the better to understand the subject I have drawn out the plan to a large scale, and you will see that we may take Phileus's portico quite apart from the rest of the building. Its date is put as somewhat about 300 B.C., and we may accept this date as very probably correct, the portico being only a few years later than the grand temples at Priene and Ephesus, and than that beautiful work, the Choragium of Lysicrates at Athens —long, in fact (which is the main point), before the Roman influence debased Greek art. The mere outline of the echinus of the capital, as compared with the coarse form of that from the portico, known as that of the Agora [Illustn. xxvi. C], but now considered to have been the gate of the Oil Market at Athens, and which was built under the Romans, *circa* A.D. 12, would reveal this to an architect. I need not say much as to the manner in which the outline of the echinus, as of other mouldings, varied at different periods of Greek art. Beginning with a full round outline, as at the old temple at Corinth, it gradually became more refined until, in the best periods—viz., in Pericles's time, it formed part of an exquisitely beautiful conic section—a hyperbola so delicate that it is difficult, until it is seen in a bright light, to detect its curvature at all. In later times it again assumed a coarser outline, as I have described in respect of the Agora, until it became the coarse, round, Roman ovolo. The delicate outline of the Eleusis moulding proves that the portico was from a purely Greek design; but other parts of the remains prove that this design was never completely worked out. You will see that the flutings of the columns are cut only at top and bottom, as were those of the external columns at Miletus, and that they have fillets [Illustn. xxvi. D]; both circumstances showing that the work had been stopped.

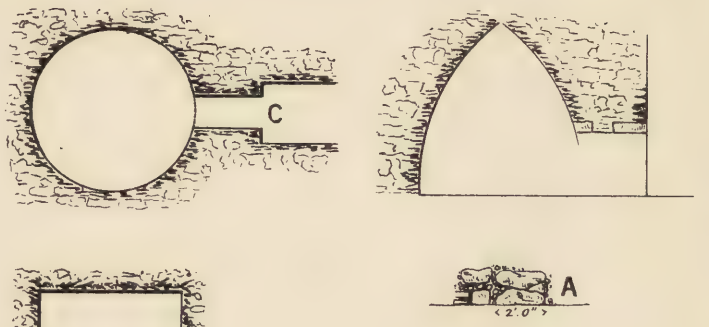
Leaving now this portico which is unquestionably Greek, and untouched since its erection, we may pass to the main building itself, which is spoken of in such high terms by Vitruvius and others, that the question as to its perfect form is a most interesting one. You see that its plan is utterly unlike any other Greek temple, and more like that of the hypostyle halls of Egypt; whilst its orientation is, also, equally unlike that of the Greeks as I have shown by plans of the Temples of Ephesus and Miletus. And when we remember that the rites of the Eleusinians are said to have been adopted from those of Egypt, we might almost incline to the belief that the plan was so also; the present one being merely an enlargement of the original temple burnt by the Persians B.C. 484

(Herodotus ix.). This edifice produced from the late Mr. Fergusson one of the most ingenious of his many restorations, based on the meagre statements which we have from ancient writers. From the statements of Vitruvius and Plutarch, we may safely assume that there were two rows of columns, the lower with its architrave by Corœbus, and its entablature with the upper row of columns by Metagenes, there being an entablature, no doubt, over these. Mr. Fergusson supposed that the centre part was, originally, left quite open and without the central columns. Then the natural way of covering the sides would be as shown on one of his drawings, the top of the lower columns being about level with the lower terrace at back. Then comes the debateable part of the matter. What did Xenocles do? All agree that he covered over some part. But *what* part and *how*? Now, there is but one word in the accounts which can be a matter of dispute, viz., οπαιον, and it is curious to find how many meanings have been given to this word. The Society of Dilettanti consider it to mean the spaces formed by an ornamental framework of timbers, crossing each other at right angles, and which Xenocles surmounted with a roof covered with marble tiles. Mr. Ashpitel translates it in the ordinary way, viz., "literally the opening." The word comes of course from the same origin as that of our common word "metope." The author of "Eleusis" in the new edition of the *Encyclopædia Britannica* translates the word as a dome,—"Built the dome on the top." So also does Mr. Langhorne in his translation of Plutarch, whilst the latest translator, Mr. Clough, says "he roofed or arched the lantern in the top," but he adds, "of the Temple of "Castor and Pollux," which must surely be a mistake of the printer. Finally the author of Xenocles in the *Dict. of Anc. Biog.* (1849) admits the difficulty but suggests, as most probable, that Xenocles's addition consisted of a pediment with its tympanum open, according to the ancient fashion, to light the principal chamber of the temple. Putting aside the cross timbers and dome as scarcely probable renderings of the word, we may, I think, take Mr. Fergusson's restoration as being the nearest yet suggested to the original design. He supposes that the sides, having been covered as I have described, would leave an open centre space which was afterwards roofed by Xenocles (as our Royal Exchange has lately been by Mr. C. Barry, but in a somewhat different way), much as the Egyptian halls were roofed and lighted, merely putting the sloping roofs in place of the flat ones which were all that was requisite in Egypt. This theory would be, of course, somewhat discredited, though not quite overthrown, if it were proved that a row of columns existed in the centre. None are shown on the Dilettanti plan, nor did I see any marks of them in my visit in 1884. But they are shown on a plan of the ruins which I have since seen, and, assuming this to be correct, are we to take for granted that we have the remains of the building now which Plutarch describes? For, acknowledging the immense size of the cell of this temple, do we find that the result appears to justify the glowing descriptions of it given by various authors? It is, to begin with, described as of extraordinary dimensions, the largest temple ever erected by the Greeks; and Vitruvius places this temple with those of Ephesus, Miletus, and the Athenian Jupiter, as the only ones embellished with work in marble.

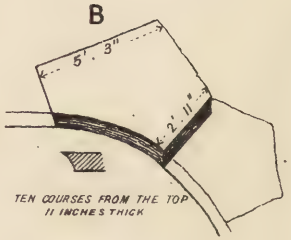
Now, considering the great number of splendid buildings at Athens alone which

XXX. NOTES MADE DURING TOURS IN GREECE, 1881 AND 1884. (XXV).

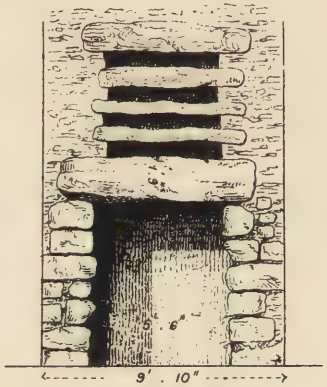
MENIDI



MYCENÆ



SCALE OF 10 5 0 10 20 FEET



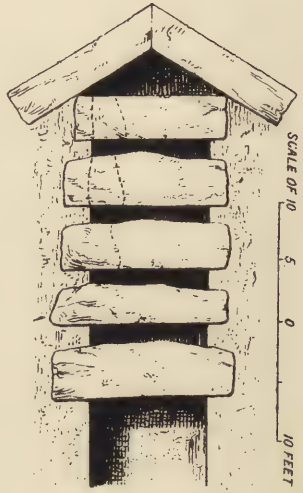
MENIDI, C.



MYCENÆ, D.



CHINA



EGYPT.

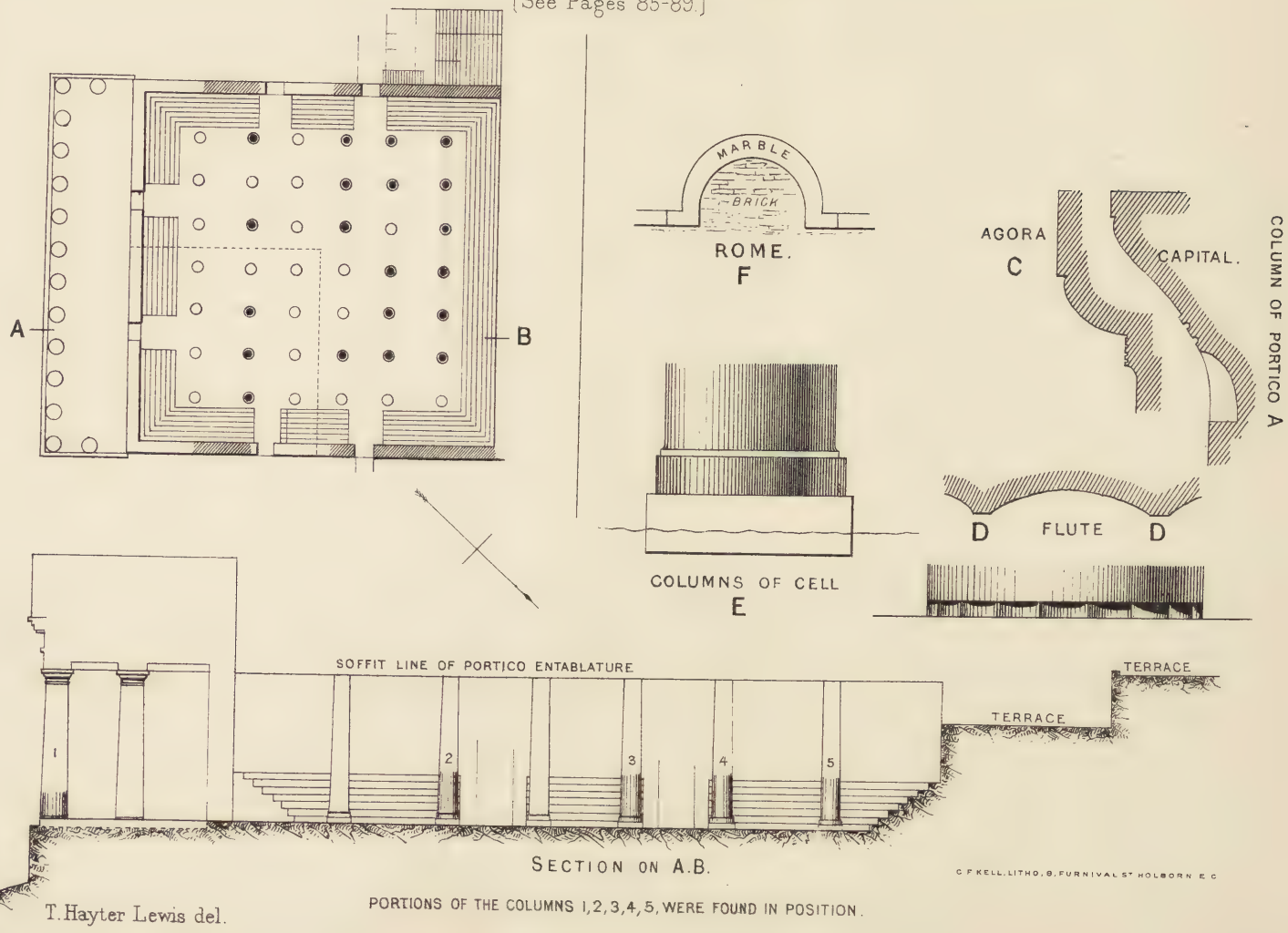
T. Hayter Lewis del.

(See page 82)

C. F. KELL, LITHO., 9, FURNIVAL ST HOLBORN, E.C.

THE TEMPLE OF CERES AT ELEUSIS.

[See Pages 85-89.]



were executed entirely in Pentelic marble, there must have been something more than the material itself to which Vitruvius alludes; and, in turning to the work at Ephesus and Miletus, we can see, probably, what he meant. We may eliminate the Olympium from our consideration because we may be fairly sure that, whatever Vitruvius might have seen or heard of it, the ruins which we now see are not of the temple which stood in his time. The sculptured columns at Ephesus, of which we have some fine remains, thanks to Mr. Wood and Mr. Newton, at the British Museum, mark that temple out at once as being indeed embellished; and the extraordinarily rich carving on such of the bases and capitals from Miletus which can be seen at the Louvre makes us very well to understand the allusion to that temple also. But where do we find such application to Eleusis? Its portico was, no doubt, grand, but its columns were very little larger than those of the Parthenon, and its twelve-columned portico would scarcely be said to stand the contrast with the peristyle of that magnificent work. Now look at the plans of the Temple at Ephesus and Miletus, and see if you can satisfy yourself why, either in plans, or size or materials, the latter should rank with them. Then look at the meagre columns [Illustn. xxvi. E.], barely 4 feet 2 in diameter of coarse stone, unfluted and with a little curve at their base, can you suppose that such things were designed by Ictinus, and lauded by Vitruvius? I thought it possible, on considering the matter at first, that these columns might have been cased with marble, as the walls had been. I admit that I know of no such casing in Greek work, but it was sometimes used by the Romans, who copied from the Greeks. There is an instance of it [Illustn. xxvi, F.] from the Palace of the Cæsars at Rome, which I sketched there a few months since; but I cannot see how a casing could well be fitted here, on account of the way in which the black marble plinth projects. Then I ventured to suggest to myself the heretical opinion that this cell might not be Greek at all, but be a rebuilding by the Romans. Athens and its neighbourhood had undergone many changes in their latter days. Not many years (*circa* B.C. 250) after the portico was built, Philip, the son of Demetrius, ravaged all the neighbouring villages, destroying the sepulchres and temples, and it is recorded of him that he proceeded to Eleusis in hopes of surprising the temple. In the wars with Mithridates, Sylla is also recorded to have ravaged the suburbs, not sparing even the sepulchres, treating it as Mummius treated Corinth, *circa* B.C. 146. Then we know that the Romans executed considerable works in connection with the temple, it being the fashion of the higher ranks to be initiated in the Mysteries, and Colonel Leake declares that Eleusis was one of the most frequented places in Greece, and perhaps was never so populous as under the Emperors of the two first centuries of our era. I ventured, therefore, to suggest that the cell of the temple was a work of the Romans. It was merely a suggestion, which I put forward with all diffidence to Mr. Penrose, under a distinct feeling that neither Ictinus, nor any Greek of his time, could have designed such working, and that no architect could have spoken of it in the glowing terms I have quoted.

My drawings were done and the above written before I had seen the last numbers of the πρακτικα of the Athenian Society, in which their architect, M. Philios, describes the finding of Roman inscriptions on some of these columns, and Mr. Penrose writes to

me—"the wretched columns you have remarked upon are Roman, and rather *late* "Roman." But the foundations of some of Ictinus's columns have "apparently been "discovered, having a considerably wider intercolumniation than those you noticed, but, "so far as I know, not an atom of the structure itself has been found. The surmise is "that, whatever the columns may have been, the internal fabric was mainly timber." I need scarcely explain with what exceeding pleasure I found that my heretical opinions had been thus well supported. The result, then, of all these excavations is to show that the form of this temple (the most famous of all the temples of the Greeks and designed by their most famous architect) is still as great a mystery as that of the Eleusinian mysteries, for whose grand celebrations it was designed. As a conclusion, I may quote from Gibbon the well-known statement as to Alaric's invasion in A.D. 396, "that the "mysteries of Ceres, which had subsisted for 1800 years, did not survive the destruction "of Eleusis."

From Eleusis one passes to Corinth which, when I first saw it in 1842, had some interesting remains of a picturesque mosque, and, of course, the old columns immortalized by Byron in his Siege of Corinth. In 1858 it was so completely wrecked by one of those terrific earthquakes to which Greece has been subject that the citizens rebuilt their town two miles eastward, the whole being therefore new. The old columns, however, survived the earthquake and still stand erect. Near to the modern town is the cutting for the new canal; an excavation so gigantic, that I am almost converted to the feasibility of cutting a tunnel for the proposed Jordan canal through the great ridge in the Arabah. The engineering difficulties cannot, of course, compare with those even of an ordinary railway in a hilly country, and are very slight in comparison, *e.g.*, with the St. Gothard; but for magnitude it has few equals.

One passes thence through Nemea to Argos, Mycenæ, and Tiryns, at which last place I was present whilst the excavations were in progress: but Dr. Schliemann and Dr. Dörpfeld have described these so much in detail, and the questions as to the dates and other circumstances have been so amply gone into during the late discussions at the Hellenic Society, that I will not detain you with any description of these ancient cities.

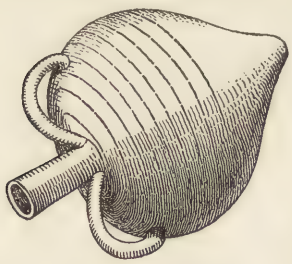
Thence one goes to Epidaurus. These remains require an excursion beyond the ordinary track, and when I first visited them I went on board a native Greek boat from Ægina and landed on the coast, riding across afterwards to Nauplia. This time I went over from Argos (a run of sixty miles there and back). But a good road is being made, and, doubtless, anyone going now will be able to drive over with little trouble. Of the grand buildings at Epidaurus three are specially noted by Pausanias, viz.—the Tholos or Rotunda, the Temple of Esculapius, and the Theatre. As my time is very limited I shall speak here only of the latter, alluding to the Tholos when I speak of that at Olympia. When I first saw it in 1842, the outline of the theatre could be clearly identified, but it was overgrown with shrubs and weeds, and half-hidden by *débris*. In 1881, however, the Athenian Archæological Society began to clear the ruins in the very careful way in which their work is done, though straightened funds cause it to be rather slow, and now one sees the theatre in a way

which enables us to realise its condition when perfect. The size (370 feet diameter) is gigantic as compared with any modern work, and for comparison let us take our Covent Garden Theatre (80 feet) and the Albert Hall (232 feet) diameter. Still larger, however, was the theatre at Argos, 450·0 diameter, and larger still that at Ephesus, which was 495·0. The Epidaurus one is especially interesting in that it is purely Greek throughout, in design and details, whereas the Dionysiac at Athens and the theatre at Argos have been largely added to or altered by the Romans. Its general plan is the ordinary Greek one, but with some peculiarities as to the orchestra and stage. Usually, the orchestra was much lower than either the front seats or the stage, so that there was a high podium before the seats and a high proscenium to the stage. At Epidaurus, however, the whole is level, with the singular exception of a wide trench or surface drain passing half round the orchestra in front of the seats. It is of marble, and the rim moulded, and the width varies from 6·7 in the centre line of the theatre to 7 feet at the ends. I understand that a trench or canal in a somewhat similar position has been found in the old Dionysiac theatre at Athens since my visit. But this was much deeper and not so wide. Mr. Penrose has kindly written to inform me that a similar one has been discovered quite recently at the theatre at Oropos, now being excavated by the Athenian Society. This was about 5 feet deep and 4 wide, covered with flat slabs. Too large for a drain, and an underground passage has been suggested. Apparently the one at Epidaurus was merely a drain. The orchestra is quite cleared, and the marble work perfect, and the stage walls are up some little height above ground, so that their plan is evident. Nearly all the seats remain, but are a good deal misplaced owing to the giving way of the ground under, and the high wall of the podium of the διαζωμα in front of the upper row of seats is all gone, except for about 30 feet in length; otherwise the audience part of the theatre is well nigh perfect. In front, over the line of proscenium, a row of columns is indicated upon a plan which was drawn up by the Greek Society, and, no doubt, several remains of Ionic columns have been found; but I could not see any signs of them on the marble plinth, and I have hesitation in believing that they really were placed as shown. The seats and every other part of the theatre are of fine marble. As this theatre at Epidaurus is still so nearly perfect, I thought it might give me an opportunity of settling several points, as to which one was in doubt as to Greek theatres, and so examined it carefully. First, as to any covering to it. We know that the audience in the Roman theatres were protected by an immense awning—the Velarium, and I looked to see if there were any indication of the great masts or other supports which must have been required if such a covering had been provided at Epidaurus; but I could trace no sign of them, and, although many good authorities consider that a veil sustained by masts and cords was used, this theatre affords no evidence that the spectators were protected from the weather in any way. The next point is as to whether the whole theatre was bounded by a covered gallery or portico, which would not only be a great shelter in case of sudden storms, but give an admirable architectural finish to the whole structure. We turn to Pausanias for an explanation, but all we learn from him is this—" But for harmony and beauty what artificer

"will take upon him to contend with Polycletus?" So we must turn to the works themselves.

In one great theatre of the Greeks, viz.—Aspendus in Pamphylia, this portico undoubtedly existed. But the whole plan of the theatre, which is drawn in Texier's *Asie Mineur*, is unquestionably Roman. At Epidaurus, I could find no trace of such a portico, though remains of an enclosing wall are shown on my drawing. It is quite clear that there must have been some such protection, yet if it were in the shape of a high wall the echo would, I fear, be very great. Was there then a high curtain or velum to prevent the actors' voices being carried away by a high wind? It is a subject of which we have yet much to learn. Then there is another important detail, viz.—as to whether the different ranges of seats were placed at different angles to the ground—the rear seats sloping more than those in front, so as to afford better views to the spectators behind than would be the case if all the seats were at an equal angle throughout. The principle of this is understood, and I need not dwell upon it. At Epidaurus, it certainly is carried out to some small extent, and I have carefully studied the sections of other Greek theatres to see if it be so in them. It is slightly carried out at Aspendus; but judging only from the drawings (as I have not visited the places personally) there is no sign of it at Cnidus, Patara, or Laodicea. The still larger one of Argos I know well, but the upper rows of seats are too much broken to allow the exact angles to be verified, and I was too much occupied otherwise at the still more gigantic theatre of Ephesus, to verify the case there. I think, however, we may say, from the definite instances which I have given, that the principle in question very slightly influenced the design in general of a Greek theatre. But the most curious of all questions to us, is that of the sound—the power of filling these enormous theatres with the voice. And the importance of this power with respect to the Greeks was vastly more so than with us. We know quite well that we can often see distinctly the features of an actor, although his voice may be lost to us; and these features, suited to his action, will tell us the history of his part, although the exact way in which he explains it may be lost. But with the Greeks this knowledge to be gained from the features was a thing unknown. The face of the actor was concealed by a rigid mask, and if the voice were but faintly heard, the spectators had nothing but the movements of the actor to guide them. Now we have plenty of experiments as to the limit of easy hearing in rooms or public buildings, enclosed and roofed. Sir C. Wren's are best known, viz.—50 feet in front, 30 feet at each side, and 20 feet behind; but this is much exceeded in our theatres, and at the Albert Hall, where the sound has to reach 163 feet in front. Mr. Fergusson well observes that, if the back of the boxes in a theatre were removed, and the voice could travel freely through clear air, the hearing would be better as there would be no reverberation. This then leads us to the Greeks, and to speaking in the open air. The most notable experiments made as to this were made, I think, by Mr. Saunders, whose book on theatres, if re-edited with modern additions, would still take a first rank amongst authorities on the subject. On a calm day, and in an open space, on level ground, he could not hear at a greater distance from the speaker than 92 feet in front, and 75 feet at each side. But trying the same experiment in the amphitheatre at Verona, where the seats are of stone and were

empty, he could hear distinctly at the very top, being 160 ft. in a direct line from the speaker. I have myself heard distinctly in the theatre of Argos, at about the same distance, even with a brisk wind blowing. Now that would include about half the audience at Epidaurus, and, no doubt, in the clear air of Greece the voice would reach still farther. But even in ancient Greece during the performances the theatres were not silent, as in Mr. Saunders's experiment and mine, and the rustling of clothes, the movement of feet, and the whispers even of so many thousand people, must have assisted to deaden the sound. Anyhow, it is certain that the Greeks did experience, at times, the need of some accessories to the voice in these great theatres, and hence we have the well known description by Vitruvius of the bronze vessels "disposed between the seats of the "theatre in cavities." Openings are left towards the cavities in the lower beds of the "steps, each 2 feet long and half a foot wide." Mr. Saunders states, however, that he could find none either at Pompeii or Syracuse. I had not been fortunate enough, in my travels, to find any of the vases nor of the cavities which contained them, and so I looked carefully at Epidaurus, as being the most nearly perfect theatre in existence, in hopes of seeing some there; but I am sorry to say that I could see no trace of them. I do not, however, mean to say that they do not exist, because the steps, though nearly perfect in number, having slipped are much misplaced, and I might have missed them. All I can say is, that I did not see them. But I have in my possession a drawing of a curiously shaped earthen vessel which has no connection whatever with Epidaurus, having been sketched by me at a mosque in Constantinople, formerly the Church of the Chora,[67] at a time when I was taking a tracing of one of the splendid Byzantine mosaics there. I noticed several of these large pots, which are about 18 inches in diameter, and of a form not now made, and found that they had been taken, during some late repairs, out of the dome (said to have been built by Justinian); that they had been imbedded in it, and that they all had been found with the open mouths towards the inside. The material of which these pots are composed is *circa* $\frac{3}{8}$ thick, was very hardly burnt, and rang well. Now, thinking of a Paper on Acoustic Pottery[68] read here in 1881, it just occurred that these pots might have had some connection with acoustics, and as they are the only ones which I ever saw abroad, I have ventured to allude to them.



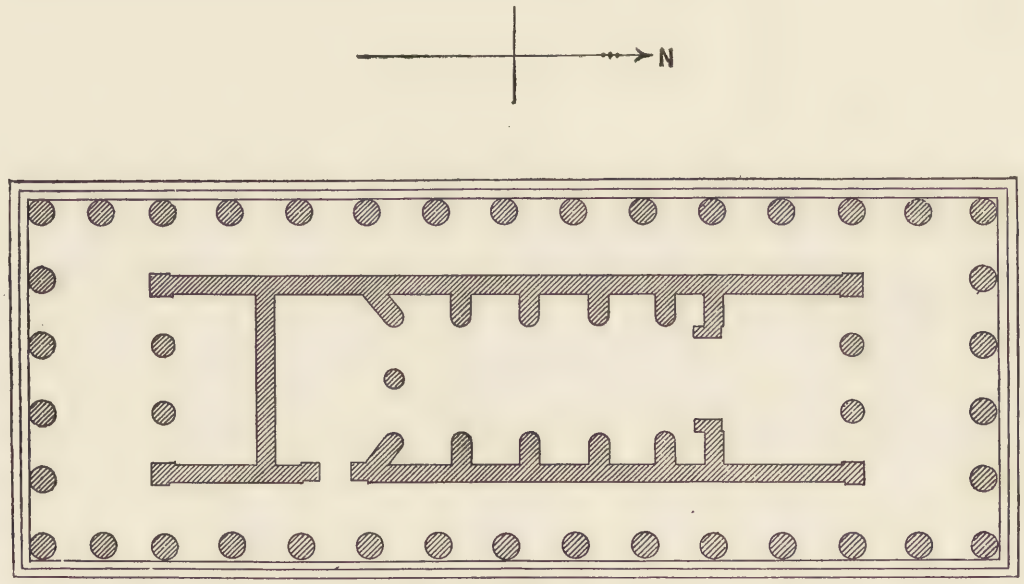
Acoustic Vase (?).

Bassæ.—This lies out of the ordinary track, being accessible only by a horse road over the mountains from Andrizzina, and is rather difficult to approach on account of the dense mists which often conceal the whole area of the mountain on which the ruins of the temple are to be found. Sometimes the most experienced guide will be

[67] Now called the Kakrieh Mosque (see page 54 *ante*, and Illustns. xxi., xxii.) A plan and description of this interesting church, the *Mone tes Choras*, is given by Professor Lewis in his Appendix to Mr. Aubrey Stewart's translation of Procopius.

[68] See a Paper on "Earthenware Pots (built into Churches), which have been called Acoustic Vases," in the Transactions 1881-82, pp. 65-96.

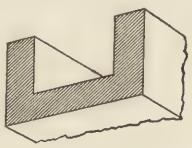
puzzled to find them, and I narrowly escaped missing them, although I was very anxious to see them on account of the discussion which has arisen as to the peculiar form of the temple, and its roof. The architect was Ictinus. Its external columns were Doric, the internal range Ionic, and the solitary column in centre was Corinthian. This, you will remember, was *circa* 440 B.C. (the date of Ictinus), and, therefore, some forty years before Callimachus, *circa* 400 B.C., who, according to Vitruvius, invented the Corinthian. The Assyrians, however, as you may see by a bas-relief in the British Museum, had used it many years before even Ictinus. The Ionic capital is very singular, and has been used in various places by Professor Cockerell, who much admired it. But I remember well looking at a cast of it at the Architectural Museum with Sir Gilbert Scott, when we began the catalogue, and he pronounced it to be the very ugliest form of the Ionic that the Greeks had ever produced. The temple is in ruins, but some of the columns are erect, and are carefully watched by the Athenian Architectural Society. They have shored up one column and its architrave, and secured another (broken) one by an enclosure of wood and iron. The area of the temple is fairly cleared, and the whole plan is easily to be verified as most of the walls are standing to a height of several feet. The temple stands on a site which is described as very grand, commanding a magnificent view over the plains to the south; but I cannot speak as to this, as we were not able to see twenty yards through the dense mist, and our memoranda were taken under a heavy rain.



Temple of Apollo at Bassæ.

Now you will see that this temple runs north and south, not east and west as usual, but that there is the very unusual feature of a side entrance. There are six columns in front and fifteen at the side. The internal columns are not detached, as elsewhere, but are united by buttresses to the walls. Now, why was this? Ictinus was too good an architect, and studied details much too carefully, to have sacrificed the

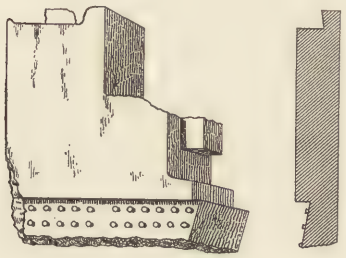
beautiful rounded forms of his columns and have deprived himself of the fine effect of light and shade given by them, if detached, by imbedding them in buttresses. What was his special object? This could not be the support of cross beams of marble, as usual in flat ceilings, as there was nothing out of the common way in the width of the cella. The bearing then would have been only fourteen feet, whereas that of the actual marble beams in the portico was only one foot less, and that of the Propylæa at Athens four feet more. No doubt the internal Ionic columns are not so strong as the great Doric external ones. But the beams would have rested on the wall beyond, and would then have been of less length than those of the Propylæa at Eleusis, which were nearly 23 feet long. I give a section of one of these large beams of the portico, the central part of which is hollowed out so as to be more like the section of a flanged iron girder than of any other which we use. We turn to Pausanias's description for an explanation and find it thus given:— (Book viii. c. 41) "A temple of Apollo, the roof of which "is of stone. This temple would stand first of all the temples of the "Peloponessus, except that of Tegea, for the beauty of the stone and the neatness of the "structure." Now this structure is peculiar. The walls, columns, and entablatures are of grey compact limestone from the neighbouring mountains; so are the ceilings of the side peristyles; but the beams and ceilings over the north and south porticos, the capitals to internal columns and the tiles to the roof throughout are of marble. But no fragments could be found by Professor Cockerell of the coverings of the main building, either of the pronaos or cella, and the temple could scarcely have been altogether hypæthral, or the roof would not have been described. Clearly this reference to the roof refers to some peculiarity in its structure and has led to a very interesting controversy, not only as to this roof but as to the roofs in general of the Greek temples. Professor Cockerell, in his beautiful work on Bassæ, considers that Pausanias refers to the marble tiling on its roof as contra-distinguished from that of Ægina, where the marble was used only to the eaves and pediments, the rest of the covering being of terra cotta. But I notice a statement by Pausanias in his account of the Temple of Zeus at Olympia (Lib. v. cap. x.), which would almost lead us to conclude that he was *not* referring at Bassæ to the marble tiling; for he mentions expressly that the Olympian roof is not of terra cotta, but covered with tiles made of Pentelic marble or stone, using the same word (λιθος) in both senses. He makes special notice of the invention of this roofing, and one would suppose that in writing of Bassæ, on his subsequent visit there, he would have given some notice as he did at Olympia if he referred to the same invention; but of this he says nothing. Now, it had occurred to several architects,—Quatremère de Quincy being, perhaps, the most noted,—that very possibly the arched canopies to statues found on several Greek coins were real representations of the forms of the roofs under which they were placed, and this theory has been adopted and well worked out by Mr. E. Falkener, in his *Dædalus*, wherein he gives drawings of the coins referred to—and in particular of one of the Temple of Juno at Samos. This coin is Roman, but was struck at Samos, and, one may suppose, represents the actual fact. Mr.



Marble Beam.

Falkener's drawings, showing his proposed restoration, are very graceful; and no one could see them without feeling a hope that they might prove to be correct. Both are Greek, but they were struck in Roman times.

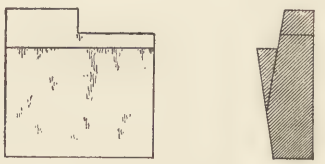
It was with a view of ascertaining whether anything had been found to solve this problem after Cockerell's visit that I was anxious to see Bassæ. In conjunction, then, with my son, I made a careful search throughout the mass of fallen stones, and, in spite of the uncomfortable weather, I do not think that one piece escaped notice; but there were only two pieces which appeared to offer any suggestion of value



A. Fragment found at Bassæ.



B. Fragment.



C. Fragment.

as to the roofing. The one A is drawn merely to show the careful manner of jointing. The first one, B, certainly appeared to be very promising, and I felt delighted to see it, as it gave the very form of the abutment which I hoped to find. It is 3 feet long at the base, 1 foot 11 inches high, and 3 feet 1½ inches broad—about the size that one would want; but there is no dowel hole or other sign of a real joint; and I am bound to say that, after a very careful examination, I felt very strong doubts as to whether the angular line was not an accidental fracture; but this is not at all certain, nor can I suggest any other form from which the stone is likely to have been broken. I may remark that it is the very form which would be required for the springing of the arch which Cockerell shows at the end of his volume, although he does not allude to it either in his other drawings or descriptions. The original and very beautiful drawing of this arch (together with his manuscript notes), has been most kindly lent to me by Mrs. F. P. Cockerell. The other stone, C, has a very decided and very peculiar double bevel, distinctly worked so intentionally. It is in its longest dimensions of length and width the same size as the other, but only 14 inches high in its thickest part. For this stone also I can assign no definite position, unless it be for a ridge-piece, and I leave the problem to be solved by some of my young friends.

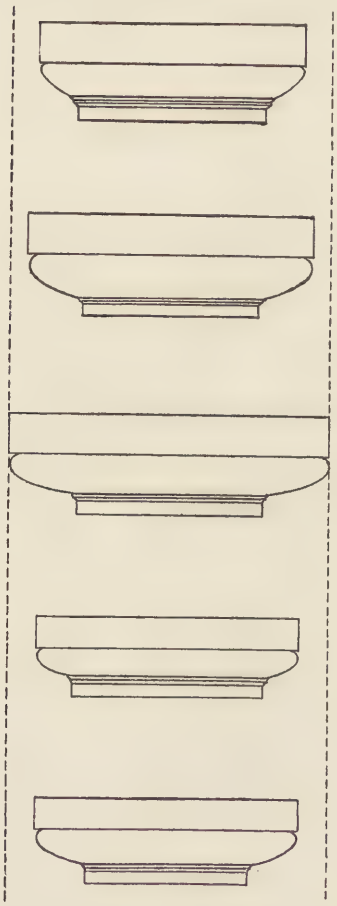
Olympia.—From Bassæ one passes through a beautiful country, practicable only for horsemen, to Olympia. The details of all the excavations there have been given in the splendid work published by the Prussians. This is to be found only in special libraries, but an excellent abstract of it, in an octavo volume, very well illustrated, has been written by Adolf Bötticher, and may be had at a reasonable price. I must refer you to these books for the study of the subject, as my time will allow me to give merely a general description of the excavations, together with special notice of one or two buildings which are of exceptional interest to architects.

The city lay at the foot of the steep hill Cronios, and was bounded on the west by the river Cladeus, and on the east by the Alpheus. It was sacked by Alaric in 395, and overthrown by an earthquake some 120 years after, and was then (fortunately as it now happens) buried by the *débris* from the hill and by the sand and mud from the rivers which run with great violence in the wet seasons, and overflow the country. The site has from time to time been identified by various travellers, from Dr. Chandler in 1766 to Mr. Stanhope in 1813. In 1875 the Germans undertook the excavations, which they continued in the most careful and systematic manner until recently. The first correct plan of the ruins, so far as they could then be identified, was made in 1813 by my old friend Mr. Allason (whose name will be well remembered by members) for Mr. Stanhope. The plan I possess is an enlarged copy of the German one, showing very nearly the state of the ruins as I saw them in 1884. The Germans had then ceased from their work and the Greeks had only recently begun. A space in the centre is the Altis, originally a grove (ἄλσος), and said to be about 650 feet by 450 feet, somewhat less than Berkeley Square, taking the line of the houses. All was overthrown by the terrible earthquake, and the columns, walls and cornices now lie in heaps on the ground.

At the north-east angle is the entrance to the Stadium, of which each end only has been excavated; to the south of it was the Hippodrome. All the Altis and the remainder of the ground adjacent have been thoroughly excavated by the Germans, and the greatest credit is due to them for their zealous care for the ruins and the treasures therein found. I may say the same, distinctly, for the Athenian Archæological Society. The chief building, the famous Temple of Jupiter, is at the south-west part of the Altis. The walls and columns of this, and of nearly all the other edifices, are built of limestone from the neighbourhood. Pausanias describes it shortly thus:—"A Doric building, "and outside is a colonnade. The temple is built of stone of the district. Its architect "was Lebon, a native of Elis. The tiles in the roof are not of baked earth but of marble "to imitate tiles." Then he describes the sculptures of the pediments by Pæonios and Alcamenes, and the cryselephantine statue (one of the seven wonders of the world) by Phidias. This has long since perished, having been carried to Constantinople a short time before Alaric's invasion; but much of the other sculpture has been found, and casts of portions can be seen in any of the principal museums. The date of the foundation of the building was about 470 B.C., Phidias' work and the other sculptures being several years later (*circa* 435). Its dimensions are about 210 feet by 91 feet. It will interest Biblical scholars to hear that the well-known antiquary, Monsieur Ganneau, has produced strong evidence to show that the Veil of the Holy Temple at Jerusalem, which is known to have been taken away by Antiochus Epiphanes, when he dedicated that Temple to Jupiter, was then placed by him in this temple to the same deity at Olympia.

To the east of this temple was found the celebrated statue of Victory, described by Pausanias as "the design of the Mendæan Pæonios, and on a pillar made from spoils "taken from the enemy," as to which he gives a long reference. This statue is almost perfect, except the head, and an excellent cast of it, mounted on its high pedestal, is

at the British Museum. The small temple northward is the Metreum, as to which I need not detain you ; and northward of this is a row of small temple-like buildings which were the treasuries of various States and cities.



Capitals of the Heræum.

To the west is the temple of Juno, which merits more notice. Pausanias says, "its architecture is Doric, there "are pillars all round it; one pillar in a chamber at the "back of the temple is of oak. The architect's name is "not recorded." He further tells us that it was in honour of Juno that the famous races by maidens at Elis for an olive crown were run. It was in this temple that he describes the celebrated statue of Mercury carrying the infant Bacchus, the work of Praxiteles, and it was there found accordingly. It is too well known to require any description from me ; but no cast could show the exquisite beauty of the work itself. To an architect this temple, which is now supposed to be the most ancient known, is an object of great curiosity on account of the singular difference in the size and proportions of its columns, of which it has the unusual number of sixteen at the sides to only six in front. Usually, of course, their outlines are identically the same ; but here they vary in the most singular way, the reason assigned being, no doubt, the true one, viz., that the ancient temple had columns of wood, that these gradually rotted and were replaced from time to time by others of stone, the proportions being those, in each case, usual in their time, just as a thirteenth-century architect would have replaced Norman work by his own Early-English. I have drawn some of the capitals of those columns to a large scale, and the difference will strike you at once. I know of but one instance at all similar, viz., at Selinus in Sicily, where the difference in date between the several parts of the building was detected in the same way.

There are very many other edifices of great interest in and about the Altis, but I must content myself with a notice of one other only—viz., that of the circular one, the Tholos—west of the *Heræum*, and known as the Philippeium, having been built by the father of Alexander the Great, or by his directions. Philip died in B.C. 336, which must be about the date of this Tholus, which is thus described by Pausanias :—"A round "building, on the top of which is a brazen poppy, as a clamp for the beams. It is "built of baked brick, and there are some pillars round it." Then he describes some cryselephantine statues in it. I need not point out that this form, so well known in Roman times,—as, *e.g.*, at Rome and Tivoli,—was but little known in Greece; and, in fact, the general impression is that this beautiful architectural form was

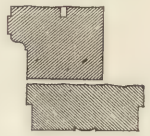
an invention of the Romans. This evidently was the feeling of some of our best writers. Mr. Freeman, in his *History of Architecture* (p. 129), says:—"Greek "architecture is horizontal, definite, rectangular, with one unvaried construction and "one unvaried outline;" and at p. 143,—"The circular form, employed by the Greeks "only in such toys as the monument of Lysicrates, now [in Roman art] began to be "used in structures of great extent." Even Mr. Fergusson seems to adopt this view, for he says in his *History* (Vol. i., p. 272):—"The Romans borrowed from the Etruscans "a circular form of temple unknown to the Greeks, but which to their tomb-building "predecessors must have been not only a familiar but a favourite form. As applied by "the Romans it was generally encircled by a peristyle of columns, though it is not "clear that the Etruscans so used it." And again (Vol. i., p. 382):—"It is, perhaps, not "too much to assert that no ancient classic building of circular form has any pillars used "constructively in its interior." But we now have the Tholus at Olympia, and another more curious at Epidaurus, of which our old friend Pausanias writes:—"Polycletus it "was who designed the theatre and the round building;" this round building having the hitherto unknown range of columns internally. Its remains, so far as I could see them, appeared to be so scanty that I preferred to take the Tholus of Olympia as the type of a class of buildings whose form the Romans are now found, somewhat unexpectedly, to have borrowed, as they borrowed their details, from the Greeks. This building was about 49 feet 6 inches in diameter, measured on the bottom step, and it had a peristyle of eighteen Ionic columns round a cella of 24 feet 8 inches diameter in the clear. *Murray's Guide* says "14 feet 8 inches," but this is clearly an error, as my measurements agree with the German above given. Nothing remains *in sitû* but the foundations, but these are perfect, giving the general dimensions, whilst we are left to fill up the details from the fragments which lie scattered round. Each one of these I carefully measured, except where in duplicate, as I was very desirous of obtaining, if possible, a good restoration of this unique building.

I have now put them together, and by the help of the German restoration can, I think, fairly well make out the greater part. We have the bases and Ionic capitals, so that, taking the ordinary proportions of the Order, we get the height. There are sufficient remains of the entablature to enable us to restore this; and some great blocks of stone, carved in diamond forms, were evidently parts of the ceiling of the peristyle, so that we can obtain its exact width, which is again given by the marble slabs of the pavement, which are carefully cut to the curve. There remains then the cella, and the restoration of this presents a somewhat difficult task. There are some pieces of marble which clearly formed part of the lower portion of the inclosing wall; and three pieces also of marble 3 feet 5 long each, but broken at the ends, which formed the surbase moulding. All the moulding of these were carved in the most delicate manner, but, unfortunately the paper casts which I took of them did not come out well. Another piece of marble, quite plain, seems to have formed part of the dado. The pieces, D and E, I found in the remains, close by, of the Byzantine church, thought to have been Phidias' workshop; but the curvature, the kind of marble and of mouldings left no doubt in my mind that

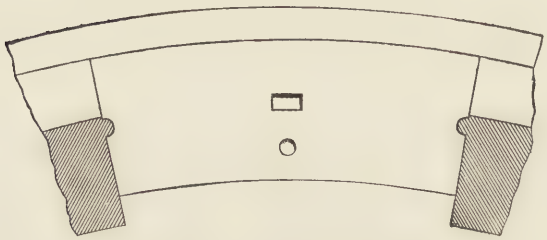
they belonged to the Tholus, and that the mouldings were those of its doorway, and the flat portions its lintol. One other piece which we may call of inestimable value to architects, is that marked F. It shows distinctly that the interior was decorated by a row of semi-engaged columns, said to have been Corinthian. The height of the upper part of the cella wall is fixed by the great stone whose mouldings show it to have been opposite to the architrave. I apprehend that the design was, therefore, much as I have drawn at C and F, *i.e.* the great blocks of marble coming between



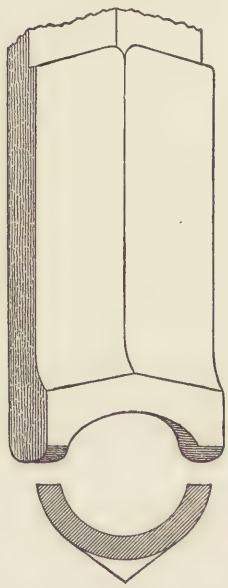
E. Fragment of the Philippeum.[69]

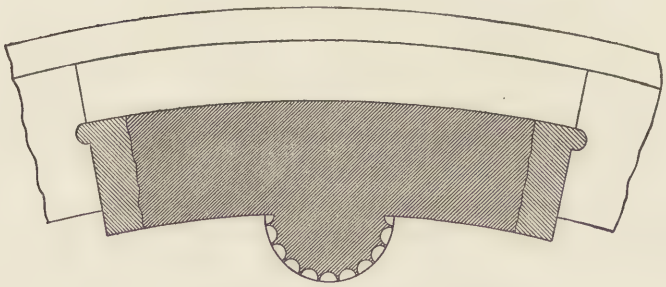


D. Fragment of the Philippeum.[70]



C. Fragment of the Philippeum.[71]





F. Fragment of the Philippeum.[72]

L. Marble Tile.[73]

the stone columns, the marble being continued inside and out, so far as the dado, with thin slabs of marble. According to the account of Pausanias, the outer wall (above, I suppose, the marble) was of burnt brick. I could see no remains of this. The German drawings show nine semi-engaged columns internally. If this were so, the pieces broken off the remaining stones and blocks of marble must have been rather large. But I am not aware of any direct authority for the number of nine, and if there were ten semi-columns the present remains would fit in well, and there would

[69] The central block of marble is 2 feet 4 inches by 1 foot $1\frac{1}{2}$ inches.

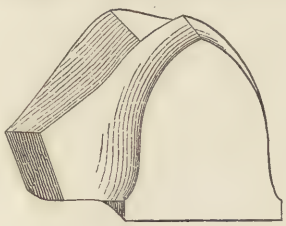
[70] The upper course of marble is 1 foot in its widest part ; the lower course is 6 inches high.

[71] The hatched portions are of stone ; the marble block between them is 3 feet $6\frac{1}{2}$ inches in length.

[72] The hatched portions are of stone, 14 inches thick ; the semi-column is 1 foot $3\frac{3}{4}$ inches in diameter.

[73] The marble tile is $7\frac{1}{2}$ inches in width.

not be a column directly in front of the door. The chief feature in doubt is the roof. The Germans restore this with a sort of clerestory. Picturesque, no doubt; but the great stone, which seems to fit here, has a slope at top coinciding with that of the outer cornice, and I am afraid that one roof covered the whole, and was formed of terra cotta tiles as usual. In any case, the eaves and lower parts of the roof were of marble, highly ornamental, as shown at L M N. One could, of course, wish to consider that the



M. Marble Eaves.[74]





N. Marble Gutter.[75]

Greeks had invented the dome, as well as the circular peristyle, and so finish the Philippeium. But I am afraid that one cannot believe this. The beautiful Choragic monument of Lysicrates is often quoted as being the precursor of the dome, but the circular form, externally, is given simply by the delicate applied ornament, the lines of roof itself being almost straight. So are those of the octangular Tower of the Winds.

When lately at Rome and Naples, I took the opportunity of sketching the oldest bas-reliefs that I could see of circular buildings, and I found invariably that their roofs were sloping, not domed. How that at Olympia was ceiled I could not ascertain, nor does the Tholus at Epidaurus afford us any distinct clue. I give a drawing of this restored by the architect (Philios) of the Athenian Archæological Society, as published by them, and it shows the roof to be finished in the same manner as that which I have shown for the Philippeium. But he leaves the form of the ceiling undetermined. Possibly it might have been flatly domed, as was the ceiling of the Choragium; possibly conical as that of the Tower of the Winds, or Horologium of Andronicus Cyrrhestes, erected (*circa* 100 B.C.) at Athens,—a building of much the same size internally as the Philippeium, and wherein the octagonal plan of the lower part is brought, at top, into a circle, in a manner which reminds one more of a southern French building of the 11th or 12th century than one of the classic Greeks. But it might have been quite otherwise: for the more we know of Greek art, the more we find of freedom and variety in its designs.

For the reasons which I have already given as to the unexpected appearances of the circular buildings, I have entered more into detail as to them than in other cases, and I would say, now, a few words as to their architect. Pausanias distinctly gives the design of the Tholus at Epidaurus to Polycletus, whose date, as usually given, would be about that of Ictinus. But I am informed by a first-rate authority, viz., Mr. Stuart Murray, of the British Museum, that Pausanias is now considered to have mixed up the works of two men of the same name, and that the real architect lived in the 4th century, about the

[74] The face of the marble is about 5¼ inches in width at the springing of the pointed top.

[75] The piece of marble forming this gutter is about 6 inches deep, and the horizontal width at top about 3¾ inches.

time of Philip. If so, these two circular buildings and that of Lysicrates would all be of about the same date.

With this I conclude my notice of the old Greek cities, such as they appear on coming again to light. It is a mere sketch—a summing-up in each case in a few lines of the results of what it has taken others years of patient labour and scholarship to work out. I have but trodden in their steps; but I wished in so doing to show that these discoveries have shown us, did we need showing, how many a problem has yet to be worked out in considering the architecture of the Greeks. Take its best example—the Temple. We know, indeed, its outward form and details from base to roof; but our knowledge well-nigh stops there. The form of the roof itself is an enigma. Was it continuous throughout, or was it broken by the hypæthron? or was it divided lengthways, as Fergusson proposed? And the *Interior*. This was columnar; so far we know. But had it a triforium as our cathedrals, or a clerestory, as, again, Fergusson proposed? Were the gigantic statues of ivory and gold, whose grandeur we can but faintly picture to ourselves, sheltered from the snows of winter, the rains of autumn, and the heat and fearful dust in summer, simply by a veil, or were they protected, and the whole temple fitly finished by that triumph of construction—the arch; known, as is clearly seen, to the mother of Grecian art, Assyria? There is enough in these questions alone to exercise our minds, and to show us how great a boon to all, and to our young friends especially, must be that British school of Archæology at Athens, with our Fellow, Mr. Penrose, at its head, to aid the studies of those who may be fortunate enough to pursue them on the spot. It is there in the bright, clear air of their country that the arts of the Greeks can best be studied.

T. HAYTER LEWIS.

XXXI.

DOMESTIC ARCHITECTURE IN JAPAN.

By Josiah Conder, *Fellow;* Architect to the Japanese Government.

In endeavouring to describe the domestic style of building peculiar to Japan it will be necessary occasionally to allude to certain habits of life pertaining to the people of that country, some of which are the rational results of climate, many of which are closely associated with a romantic tradition, but not a few of which belong to their past rather than to their present civilisation. It may be that the passing type of civilisation in Japan has more attraction for the artist, and more poetry for the lover of romance, than has the phase of change through which the nation is now moving. But the eyes of its people having been opened to what is passing in the modern world of progress, and it can hardly be expected that their aspirations would be satisfied with posing as an æsthetic picture to other nations of a quaint and old-fashioned type. There are, however, not wanting writers who would seem to imply that it is the pre-ordained duty of the Japanese to remain as they were, for the express purpose of being curious and fascinating to the outside world. They seem to say: "You are indeed a remarkably "picturesque people, and your quaint customs, costumes, and buildings are so refreshing "a sight to the artist and *blasé* traveller, so unique in this utilitarian age, that it is really "a shame to change them." Now there is no more patriotic nation under the sun than that of the land where it rises, and no nation more ardently attached to its historical traditions than that which claims for its Emperors descent from the primeval gods; but its patriotism and self-respect have taken the not unreasonable form of a desire to maintain its independence, and in so doing to partake of the scientific, commercial, and political progress enjoyed by other advanced countries. If it should be unavoidable in such a march of progress to throw away a few *impedimenta* in the form of curious and obsolete trappings, or gay plumes and ornaments, it must be done, though not without, perhaps, a pang of remorse. So far has Japan already advanced upon this new path that many of the modes of life and thought, which form the only explanation and *raison d'être* of their old architectural arrangements, are quickly becoming obsolete. As a natural consequence the necessity for new arrangements is daily increasing.

It has, I think, been generally assumed that the architecture of a country (and I use the term architecture to designate any style of building irrespective of material), is governed both by the climate of that country and by the national habits of its people. Of the latter part of this proposition the converse may, however, be true in some measure, namely, that a nation having arrived at a system of constructional arrangement in its buildings, possessing the advantages of cheapness and facility of erection, such a method of building may to some extent control and regulate its domestic habits. That this supposition is considered true with reference to a large portion of the European public is amply shown by the agitation directed towards the better housing of the poorer classes. It may be equally true in relation to a country as it is with reference to a class. Especially may it be true in a land closed for many centuries to foreign intercourse, and, during such seclusion, particularly distrustful of all internal innovations. The ideas of domestic privacy, decorum, and luxury belonging to our Saxon forefathers, who were content with the large smoky hall, shared in common with their ladies, their visitors and their domestics, would have perhaps changed less rapidly had it not been for the external influences of fashion and progress brought from other parts of Europe. Our stone quarries and our brick fields would have been industries of much later development had it not been for the example of France in the one case, and of Holland in the other. Whereas, then, owing to the constant communication between different countries in Europe, and the consequent incentive to progress, wood as a building material was largely relinquished by us at an early stage of our civilisation, Japan, on the other hand, has retained it until quite recent times. The long retention of this material has enabled the Japanese to develop a great familiarity with its qualities, and great constructional and artistic skill in its application to building purposes. Whilst falling short of the lasting and monumental, they have attained the utmost delicacy and refinement, and their best domestic buildings can hardly be better described than as exquisite pieces of joinery and cabinet-making.

The almost universal employment of wooden houses in Japan has led to certain customs growing out of the continual fear of fires, such as would have no *raison d'être* were more substantial dwellings used. Such, for example, are the straggling and detached character of many large buildings, the habits of dispensing to a great extent with household furniture, and erecting a fire-proof store-house in connection with each residence, in which are preserved all pieces of furniture and valuables not for the moment in use. Again, the light and flimsy nature of internal partitions, and the use of perforated friezes in such divisions for purposes of ventilation, has led to the almost total disregard of privacy as an element of domestic comfort. The insufficiency of the old style of dwelling as a protection against heat and cold has been conducive to a natural hardiness and exposure to out-door life. In the winter, which is one of considerable severity, it is not uncommon in fine weather to see the whole house thrown open to admit the sunshine, the charcoal brazier serving as a means of warming the hands, the other extremities being kept warm by a crouching attitude. For similar reasons, the walls and paper slides offering no resistance to the penetration of heat in the summer, the only

idea of coolness is that of throwing the whole house open to the breezes. Sunshine in winter, and air in summer, are the two essentials of a Japanese dwelling; and, it may be that this out-door arbour-like life has contributed in no small measure to the instinctive love of nature possessed by the Japanese people.

Japan being subject to very heavy rains, one naturally looks in the houses for some provision against such storms. The roofs are of considerable slope, averaging from 30° to 40°, and a great projection is given to the eaves, which often extend sufficiently to cover a narrow verandah. Thus an effectual protection is provided against a steady downpour of rain, but when, as often happens, the rain is accompanied by violent gusts of wind, which carry the wet against the paper slides of the building, there is nothing to be done but to cover the whole of the outside with rain shutters (*amado*), enveloping the inmates in almost total darkness. These *amado* are also used at night for the purpose of closing the buildings against nocturnal dangers; in winter a welcome expedient, as helping in some measure to exclude the bitter cold, but in summer a somewhat stifling operation to which few unaccustomed to such suffocation are found tamely to submit. During the daytime these shutters are slid into shutter boxes attached at certain places on the exterior of the building. The fastening, unfastening, and sliding of these numerous shutters, is a noisy clattering performance which takes place at morning when the servants rise, and at night when they retire to rest.

The large oversailing eaves of a Japanese dwelling cut off all direct light from the sky within the upper portions of the rooms, and confine the only direct illumination to the floors of the different chambers. This was no disadvantage in the old mode of life in which all writing, reading, and painting was executed upon the floor, or upon low tables raised only one foot from the floor; but it is a considerable one when the occupant attempts to write or paint at a raised table.

I have alluded to these apparently trivial points in order to give a fair idea of the comfort afforded by a Japanese house from a European point of view, and, at the risk of detracting from the interest of my subject, I have attempted to rid it of some of the romantic glamour cast over it by others. There is sufficient interest in the arrangements, and sufficient charm in the details of the old domestic architecture of Japan, to enable us to dispense with any exaggeration as to its climatic and sanitary advantages; nor do I propose to commence a detailed description of its domestic architecture with an account of the cottages of the poorer classes, which would be both uninteresting and misleading. The hut or hovel exists in Japan as unfortunately it does in all parts of the world. The absence of furniture and lumber, the matted floors and numerous openings of a Japanese cottage, as well as the very cleanly habits of its inmates, give it a much more wholesome and attractive interior than its Western prototype.

ORDINARY HOUSES.

General.—In tracing the domestic architecture of Europe from ancient to modern times we find a steady development from the days of the common hall with curtained recesses to the present period, when not only the domestics are strictly cut off from the family, but among the different members of the family itself, separation and

privacy are secured; and the various occupations of life have each their special apartments. A somewhat similar development has taken place in Japan; the better class of houses afford separate accommodation for different members of the household, and, to some extent, apartments for different occupations. The absence of internal thoroughfares, however, and the use of every room as a passage to the next renders strict privacy impossible. The bedroom, as a distinct apartment, can hardly be said to exist. In the palaces, certain chambers, surrounded by other rooms, and less in immediate connection with the exterior, were employed as the principal sleeping chambers; but this was an arrangement intended more as a protection against treachery, and there is little in the character of such sleeping apartments different from that of other rooms. As a general rule, any room is converted into a bed-chamber by spreading sleeping quilts and pillows upon the matted floor. During the daytime such bedding is secreted in spacious closets arranged between the walls of the different rooms. A family always possesses several chests of drawers for holding clothes, and these are often kept in the recesses beneath the stairs, or in the commoner rooms of the house.

The Japanese make constant use of the hot bath, and all the best houses are provided with a bath room. The usual time for taking the bath is the afternoon or evening, so that the morning ablutions are simple, and are conducted, not in the sleeping apartment, but in the lavatory, or, in some cases, even at the well-side in the garden or kitchen court. Privies are provided at the end of the verandah passages, and just opposite to them, in the garden, is invariably an ornamental water basin provided with a ladle. This is reached from the verandah, and from the eaves of the lean-to a towel is suspended. At the end of the verandah, and forming a lobby to the earth-closet, a lavatory is often provided, with a raised sink having small shelves above.

The living rooms of all Japanese houses are always floored with neat mats called *tatami*, made of the fixed size of 6 feet by 3 feet, and rooms are described by the number of mats they contain. Passages, verandahs, parts of the kitchen, and the closets are floor-boarded. Such boarding quickly assumes a natural polish from the daily rubbing with wet cloths which it receives.

Food is served to the different rooms upon small trays, one tray of provisions being placed before each individual, and all being removed together at the completion of the meal. Each member of the family, and each visitor, is provided with a soft cushion-mat to sit upon, but it is not usual to leave such mats as part of the furniture of a room. In winter, large metal-lined boxes or bronze vases of live charcoal are placed in a room when in use, and in summer much smaller fire-boxes are provided for lighting the pipe at. The candlesticks or lamps used at night may also be mentioned; one or two chests of drawers, small low tables for writing upon, boxes containing paper and ink, little shelved cabinets for the cups, and occasionally, in the most luxurious dwellings, a small lacquered cabinet and a screen or two complete the furniture of a house.

In every house one room or more will be provided with an alcove or recess, called *tokonoma*, and a corresponding recess, occupied either by ornamental shelves or by a closed store-closet [Illustns. xxviii, xxix]. The *tokonoma* is generally adorned with a

vase of flowers or some other single ornament, and its back wall is hung with *kakimonos*. If the householder be a wealthy man he will possess, perhaps, a large selection of flower vases and pictures, but these he will keep in his fire-proof store, to be displayed only one or two at a time. The comparative absence of furniture in a Japanese room gives it a very refreshing air of neatness.

The general mode of living in a Japanese house being understood, it becomes an easier task to appreciate the different arrangements which the builders have produced for administering economically to such wants.

Middle-class Dwellings.—I shall commence by describing a small but typical middle-class house [Illustn. xxvii], and remark upon the points in which modifications generally occur. The dwelling is entered through a narrow vestibule, closed by a barred screen containing a little sliding wicket. This space communicates with the raised floor of the little ante-room of three mats in area; as the floor is generally raised about 18 inches from the cemented vestibule, a stone step is provided. This ante-room has paper slides towards the outside, and is used as a sitting-room, though serving also as an entrance hall. On one side are slides communicating with one or two living-rooms, and at the back there is a connection with the kitchen. The two living-rooms are respectively of six mats and seven mats in area, and are provided with recesses and closets. As they would be used at night also for sleeping purposes, and as the two or more female servants would sleep in the little ante-room, it is quite possible for such a house to satisfy the wants of a small family of the middle class. A narrow verandah, at the end of which is a privy, runs round two sides of the house. The kitchen is entered from the side, and has a sunken portion, level with the outside, serving as an entrance, and provided with a floor-sink or drain for washing provisions upon. The raised portion of the kitchen is boarded and supports a cooking stove, also shelves for provisions. A house of this class would seldom be provided with a bath-room, and the inmates would repair to some neighbouring bath-house. Such a dwelling would be surrounded on two sides with a little garden, containing a few shrubs, evergreens, quaintly-shaped stones, perhaps a stone garden-lantern and a hill or two. A small miniature pond might be introduced. The garden fence would be either of boards or bamboo, and would contain a picturesque roofed wicket gate. A house a little larger than this might be arranged upon the same ground plan, by converting the *tana* of the back room into a steep staircase, and building one room over as an upper floor. The construction of the outside walls of the building is of slender posts with, horizontal plates, beams and keyed ties, filled in and partly hidden with weather boarding. Those sides towards the verandah would consist simply of posts and slides, with a narrow boarded or plastered frieze above the lintols. The cill or plate supporting the slender posts of verandah would be grooved, as would also a corresponding lintol above, to receive sliding shutters for closing up the building. Shutter boxes are provided to contain these shutters when not actually in use. The interior partition walls between rooms consist, to a height of 6 feet, of paper slides, called *fusuma*, with a plastered or boarded frieze above; and the inside of the external walls where no windows occur is plastered. Ceilings are invariably boarded with wide boards, having narrow

fillets nailed across them. The kitchen portion would be unceiled, and the roof over would be provided with a small sliding trap-door, opened at will, for purposes of ventilation and for carrying off smoke. In a house of this class great elegance of finish would not be sought; at the same time the wood of the principal internal posts, and the boards of the ceilings would be carefully selected, and some pale neutral tint given to the plastering by the admixture of coloured earths or stone dust. The *fusuma*, or divisional slides, and the cupboard doors would be covered with paper of some approved tint having a slight pattern upon it. The *ramma* or frieze spaces would be filled in with thin planks of clean wood, having some simple pattern cut through, free or conventional.

Upper-class Houses.—The next house, of which I shall give a short description, is also a one-storey building, occupied by a private gentleman, and secondary only to the large summer pavilions of the nobles and their old feudal mansions. The approach is under a porchway paved with cement, having a high wooden step leading to the inclosed matted hall, four mats in area. At the side of this hall is a three-mat room for domestics, with large and small closet. The hall opens into a small inner hall or lobby of two mats, communicating with one of the principal sitting rooms (eight mats in area), and at the back, with an inner gallery which surrounds a central court or garden. On the right of this garden is a wing containing kitchen, servants' hall, and bath-room, and this wing towards the front adjoins the room devoted to hall servants, though somewhat set back from the main frontage of the house. Beyond the eight-mat room mentioned is the principal room of the house, fifteen mats in area, and ornamented at the further end with a recess or *tokonoma* [Illustn. xxix.], and decorative shelves or *tana* [Illustn. xxviii.]. Behind, and forming a group on the further side of the inner garden, are four smaller rooms, one eight mats, and the others six mats in size; of this group one room has a *tokonoma* and *todana* or closet, and the others closets only. At the back of the residence is an oblong block containing a large store and two small rooms for female servants, with a separate entrance. As is almost invariably the case in the best houses, the principal rooms form an internal angle or ⌞ shape towards the garden, which is generally on the south side of the building.[76]

Gardens.—A house such as this would have an extensive garden on the south and west sides, and a small garden of different character in the internal court. The style of garden employed within would be what is called the *Hake-niwa*, a flat garden of beaten earth, kept slightly damp and cleanly swept, dotted with winding paths of stepping stones, and rather thickly planted with low trees and shrubs. Little sunlight being admitted, a cool and somewhat gloomy air would be imparted. Some architectural feature, in the form of a stone or bronze standard-lantern, and a few curious rocks or boulders, would be introduced, and in all probability also a small sunk cemented basin for fish. Flower beds would scarcely ever be introduced in such an interior garden, and only occasionally a flowering tree, evergreens of trained, irregular shapes being preferred. The outer garden would be of more free and open character, belonging to what is

[76] Further particulars of these houses and a description, with plans and elevations of a Japanese Gentleman's House, will be found in the present volume, as an appendix to this Paper.

called the *Sansui* type. The word *Sansui* implies mountain and water scenery, and gardens in this style are designed to suggest some natural landscape. Artificial grass-covered hills of different forms and heights are distributed over the ground in a well-considered order of design, and are treated differently according as they represent near hills or distant mountains. Upon, between, and behind these hills are placed groups of shrubs, stones, and trees, also judiciously selected and placed with reference to their position in the landscape. Each group of stones is a design following fixed principles. If water can be obtained, a lake will be introduced, with quaint bridges of wood or stone, islets, and a beach of pebbles and boulders. Even in the absence of water the dry bed of a stream or lake is indicated by means of channels strewn with clean pebbles, white sand, and boulders. In like manner, failing the means of introducing at the head of a stream or lake a real water-fall, a cascade is suggested by constructing a water-shed of rocks, shaded by foliage. Turf is introduced on the hills, and to some extent on the flat portions of the garden, but large areas are finished in black beaten earth or fine sand, kept neatly raked. Paths across the black earth or sandy stretches are irregularly designed by means of stepping stones of various forms. One or two fine stone garden-lanterns are introduced as principal features, supported by stones, and sheltered by shrubs and trees. Flowering trees are planted among the evergreens in such a way that at hardly any season of the year the garden lacks the interest of bright colour. In the two cold, flowerless months the Japanese still find occasional interest in their gardens by enjoying from their open rooms the prospect of snow-covered lanterns and snow-tipped trees—*Yuki mi*, the sight of snow, being one of the pastimes of winter [Illustn. xxx.].

Tea-rooms.—The refined Japanese of the old school will generally boast some acquaintance with the philosophy and ceremonial of tea drinking, and will adorn his grounds with one of those curious little buildings, called *Cha-shitsu*, intended for the preparation and enjoyment of this refreshing beverage amid the hospitable formalities with which the pastime is surrounded. In Japan the essence of the tea-leaf has for many centuries been held in the most exalted esteem, and philosophers have associated with its use the exercise of certain virtues, such as hospitality, courtesy, cleanliness, and serenity. The *Cha no yu*, as the tea-drinking ceremonial is called, received its first impetus in Japan under the patronage of the Regent Yoshimasa in the 15th century. With the assistance of a famous priest and philosopher named Shuko, and an artist named So Ami, certain æsthetic codes and polite observances were fixed for the guidance and practice of the tea clubs. The growth of this recreation was contemporary with a great impetus given to the industrial arts in Japan, and the tea ceremonial, which produced a great demand for artistic utensils, and for a certain class of paintings, led to improvement in building, and elegance in gardening. It was reserved for the great Hideyoshi to further develop the philosophy of the *Cha no yu*, and at the same time to record a protest against all luxury and extravagance in its practice. Everything connected with the ceremony was required to be of the most simple and austere character, and, although æstheticism remained one of the leading principles of the cult,

it was the æstheticism of rustic simplicity and unassuming refinement. Such principles governed the rooms and buildings used by the tea clubs.

Certain plans remain of these miniature structures as designed by Sen no Rikiu, the greatest professor of the *Cha no yu* in the time of Hydeyoshi. Other plans exist by later masters, showing slight modifications in the arrangements established by their great predecessor, but the changes are so slight as not to need notice, unless in a Paper devoted exclusively to this branch of building. Taking one of the largest plans authorised by Sen no Rikiu, it is found to consist of one room only, four and a-half mats, or 81 square feet, in area, with the addition of a small *tokonoma* or recess. In height, as in area, and in the proportioning of all details and parts, the same idea of extreme minuteness and simplicity is carried out. Space, grandeur, and solidity are generally admitted as contributing to impressiveness in architecture. If it be possible to imagine in architecture an exactly opposite impression produced by the greatest refinement of tinyness, delicacy, and fragility, you have the sentiment inspired, and intended to be inspired, by these liliputian *Cha-shitsu*.

See what a love shell,
Small and pure as a pearl,
* * * * *
Frail, but a work divine,
Made so fairily well,
With delicate spire and whorl,
How exquisitely minute—
A miracle of design!

We all admit the charm of such qualities in Nature—in the works of the Great Architect of the Universe, and why should they not be legitimately applied to the architecture of man? But to continue a short description of the *Cha-shitsu* under consideration, it may be observed that near the centre of the floor is a sunken metal-lined fire-box, which contains ashes and, when in use, live charcoal, and an iron prong for supporting the kettle in which hot water is boiled. The northern wall of the room contains a large opening with a recess, the floor of which, slightly raised, is covered with a small mat. This is the *tokonoma*, the centre of attraction in a tea room, and containing the antique vase of flowers and the hanging picture. In the eastern wall is a small window with cill about 2 feet from the floor, fitted on the outside with a bamboo trellis, and with paper slides on the inside. The south side has, on the level of the floor, an opening 2 feet square, provided with a wooden sliding shutter, and this, curious as it may seem, is the door by which the guests enter. The floor of the interior being raised about 18 inches from the ground, and the ceremonial posture of the one or two privileged guests being a kneeling one, such an entrance is not so inconvenient as might at first be supposed. It is conducive to a polite inclination of the head and shoulders on entering, and thus partakes of the character of the ceremonial. On the same side of the room, a little above and to the side of this doorway, is another small latticed window. The western wall contains an entrance having more the proportions of an ordinary doorway, measuring 2 feet by 5 feet 3 inches in height. The door of this opening slides upon the outside; it forms the approach for the master of ceremonies, and leads also to a little scullery, called *mezu ya*, provided with an open bamboo draining-sink, boarded floor, and numerous shelves for the different tea utensils. In addition to the tea room and scullery, another detached structure is placed in the garden

for ceremonial reasons. During a part of the tea preparations the guests retire into the garden, and the building referred to is a rustic shed provided with a long seat on which the guests "rest their loins." The name of this class of building is "*Koshi kake machi "ai,*" meaning literally "place for waiting and resting the loins," the latter expression being invariably used to imply our mode of sitting in distinction from the old Japanese manner. Rules of design also extend to the gardens around these buildings, and even to the privies, garden-screens, and fences.

The construction throughout is in keeping with the tinyness of the arrangements; at the same time the most exquisite care and neatness is displayed. The delicate posts are filled between with neat plastering of a rough kind, and a plain paper dado is provided below; in the doors and ceilings thin boarding of simple kind, but of well-selected quality and grain, is used. The thinnest possible planed wooden frames are used for window and door bars, and when squareness is not absolutely necessary thin rods of bamboo, and even the stems of creepers, are employed. For the ceilings bamboo work is also used, or sometimes a kind of plaiting, worked in thin ribbons of this material. Over parts of the interior the roof-slope is allowed to intrude, and the undersides of the rafters are exposed and filled-in with bamboo work or delicate boarding. In connection with the tea rooms a special garden is indispensable, but it is not always, as with the dwelling-house garden, enjoyed as a sight from the interior. The windows are small and raised from the floor, and the inmates are supposed to keep their minds from external distraction, in order to meditate and converse upon the moral tenets of tea-drinking philosophy. The gardens are designed with an affectation of extreme simplicity and rusticity. A flat space of black beaten earth, with meandering paths of rudely-shaped stones and occasional groups of rocks and evergreens, with perhaps a quaint lantern and water basin, constitute the principal features. Coolness and cleanliness are first considered, and the most punctilious order reigns supreme.

FEUDAL RESIDENCES.

I shall be obliged to pass on to describe the residences formerly owned by the various territorial nobles, and serving as their town residences. Very few of these *yashiki,* as they are called, now remain, but the surrounding barracks and gateways in many cases exist. It was habitual for the lords of the various provinces to make yearly visits to the Shogun's Court, and in some cases they were compelled to have some member of their family continually residing in Yedo as a guarantee of loyal conduct. Hence the institution of grants of land within the different fortifications of the capital. The largest grant bestowed upon the most powerful nobles was over five acres of land, and the smallest grant which was allowed to small fiefless vassals was less than half an acre.

The most stringent rules of etiquette governed the size and construction of the buildings erected thereon. According to Mr. McClatchie attempts seem to have been made from time to time by ambitious nobles to adopt an ostentatious magnificence incompatible with their rank, and hence the institution of regulations with regard to the forms and arrangements appropriate to each class. These government decrees seem to have mostly

concerned the exterior gateways or entrances. The gateways were long low buildings of massive construction, containing large central gates, side gates, and guard-rooms. Sometimes these buildings were prolonged on either side as barracks for retainers; but in other cases the gate building was isolated, and separate long barracks were constructed on either side. The gate buildings and barracks vary in width, from front to back, about twelve to eighteen feet, and their height also varies considerably.

The *Daïmios* who ruled over a whole province were entitled to the full width and height of structure. Their gate buildings are separated from the barracks, and contain two porter's lodges, one on either side of the central *porte-cochère,* and posterns. The lodges project towards the front, like large bay windows with continuous low fenestrations filled in with thick mullions, and are crowned by fantastic carved roofs, the gable front being decorated with tracery and carving. These ogee roofs cut into the wall of the main structure just below the eaves. The central gates are from twelve to fifteen feet in span, and on either side are gates for pedestrians. The divisional posts and the continuous lintol above are of great thickness, and strengthened by the addition of bands and sockets of iron. Across the lintol is a row of projecting beams supporting the outer plate which carries the roof rafters. Beyond this again the rafters and eaves further project, so that a wide shelter is thus afforded to the entrance. Plain portions of the walls are partly covered by means of tiles pinned to the timber framing, and finished at the joints with a raised plaster roll. This system is followed up to a height of ten or twelve feet above the stone foundation; but the upper portions of the wall are finished in clay covered with a thin coating of lime stucco. The wooden gates are strengthened by numerous strips of iron studded to the woodwork; they are hung on enormous iron hinges, and fastened on the inside by means of heavy wooden bolts moving in iron sockets. An ordinary hipped tile roof, with large ridge and finials, completes the structure. The badge of the owner is displayed upon the metal clasps of the gate posts, upon the finials of the roof, and is often stamped upon the extremities of the tile rolls.

On either side of the central gate-building are long barrack-like structures called *Nagaya,* divided internally into a number of separate apartments, each having a long low window filled in with thick bars. Sometimes these bars project upon brackets like grilles. *Nagayas* of the first class are always two storeyed, and the lower rooms serve for the domestics, each apartment having a separate stair to the retainers' quarters above. The exterior walls are finished in tile and plaster like the gateway.

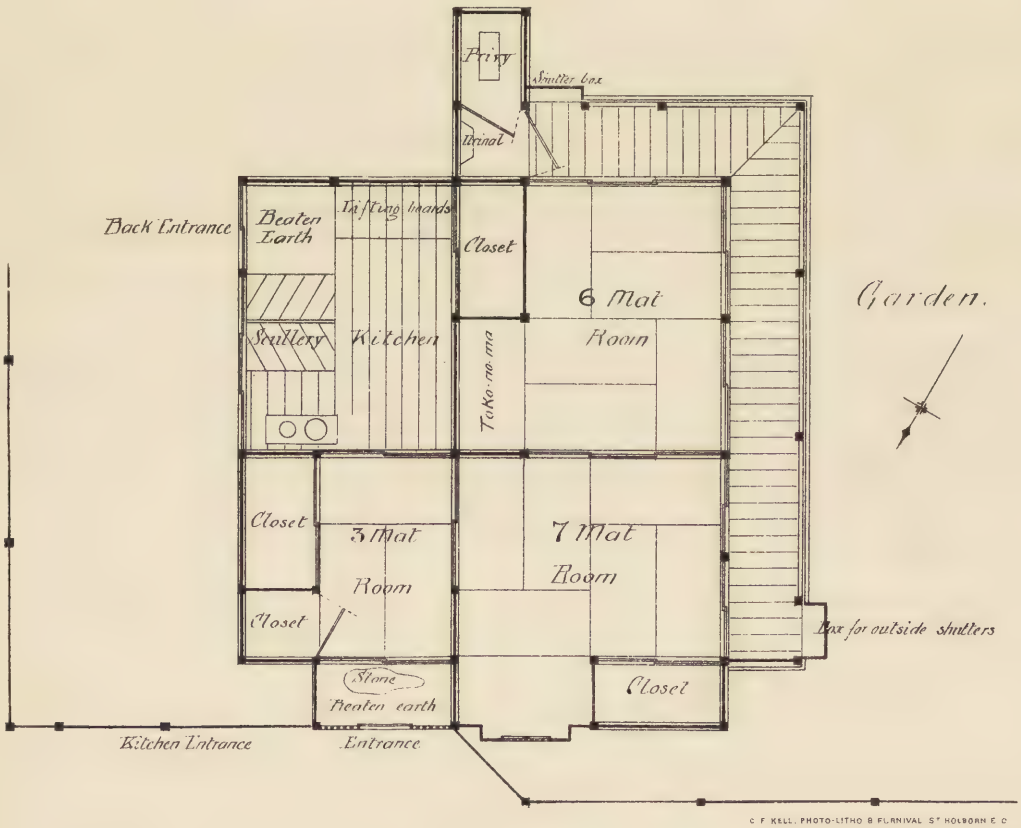
The arrangement of large square black tiles with a bold plaster roll-joint produces a peculiarly striking checker pattern. In the best buildings all of the external woodwork with the exception of the window frames and bars, but including even the rafter-ends and pole-plates, are covered with plaster, which is made to adhere by means of notches and the addition of straw twine wound round them. This system of plastering is sometimes even applied to the window frames and mullions.

The backs of these buildings do not present the same solid appearance as the street fronts. The openings are large and are filled in with paper slides. A surrounding fence on this side screens them from the inner buildings.

XXXI. DOMESTIC ARCHITECTURE IN JAPAN. (xxvii).



ELEVATION.



C. F. KELL, PHOTO-LITHO 8 FLANIVAL ST HOLBORN E.C.

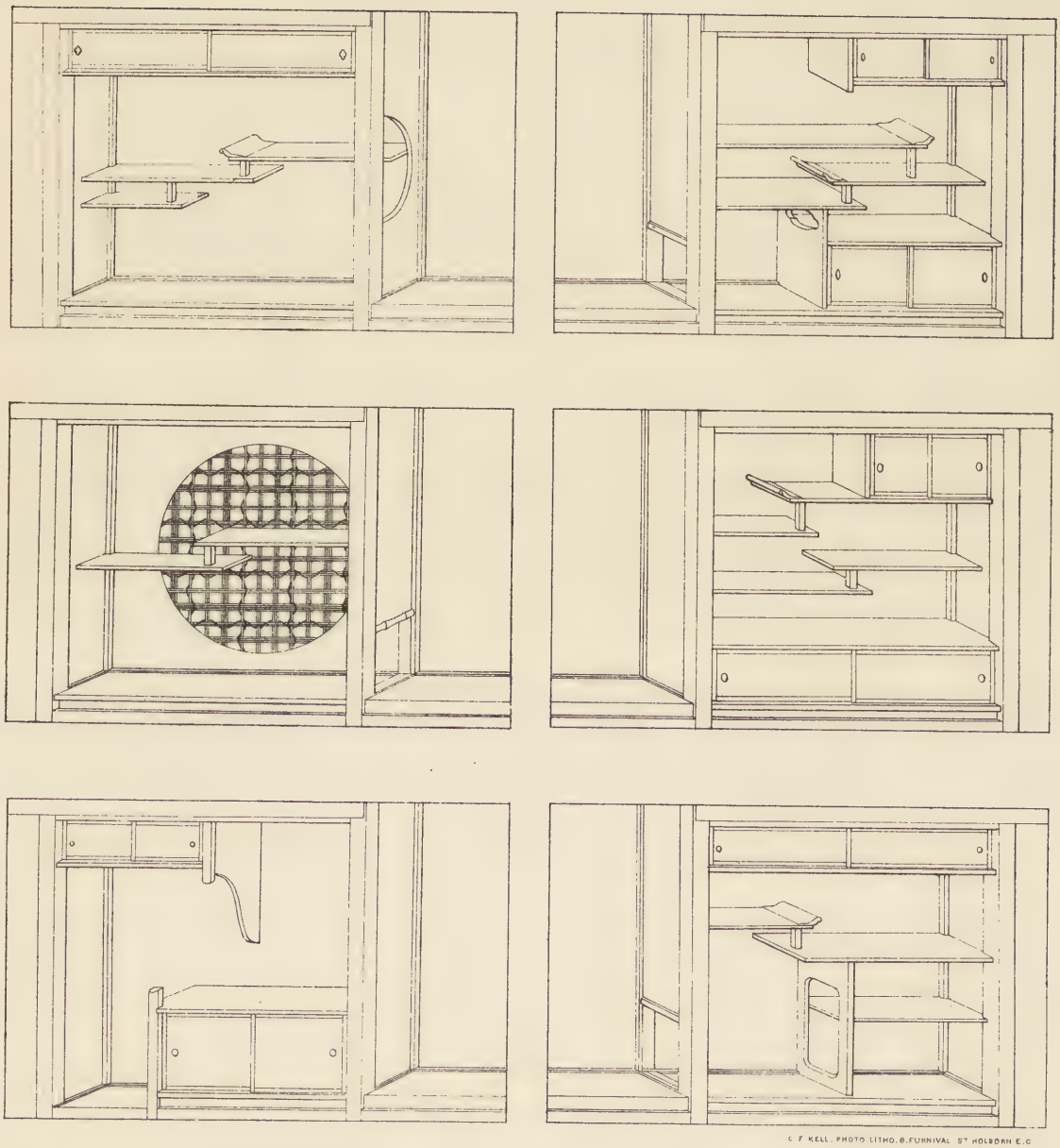
PLAN.

Scale of 10 5 0 10 feet

R.T. Conder del

MIDDLE-CLASS JAPANESE DWELLING.

(Page 107.)



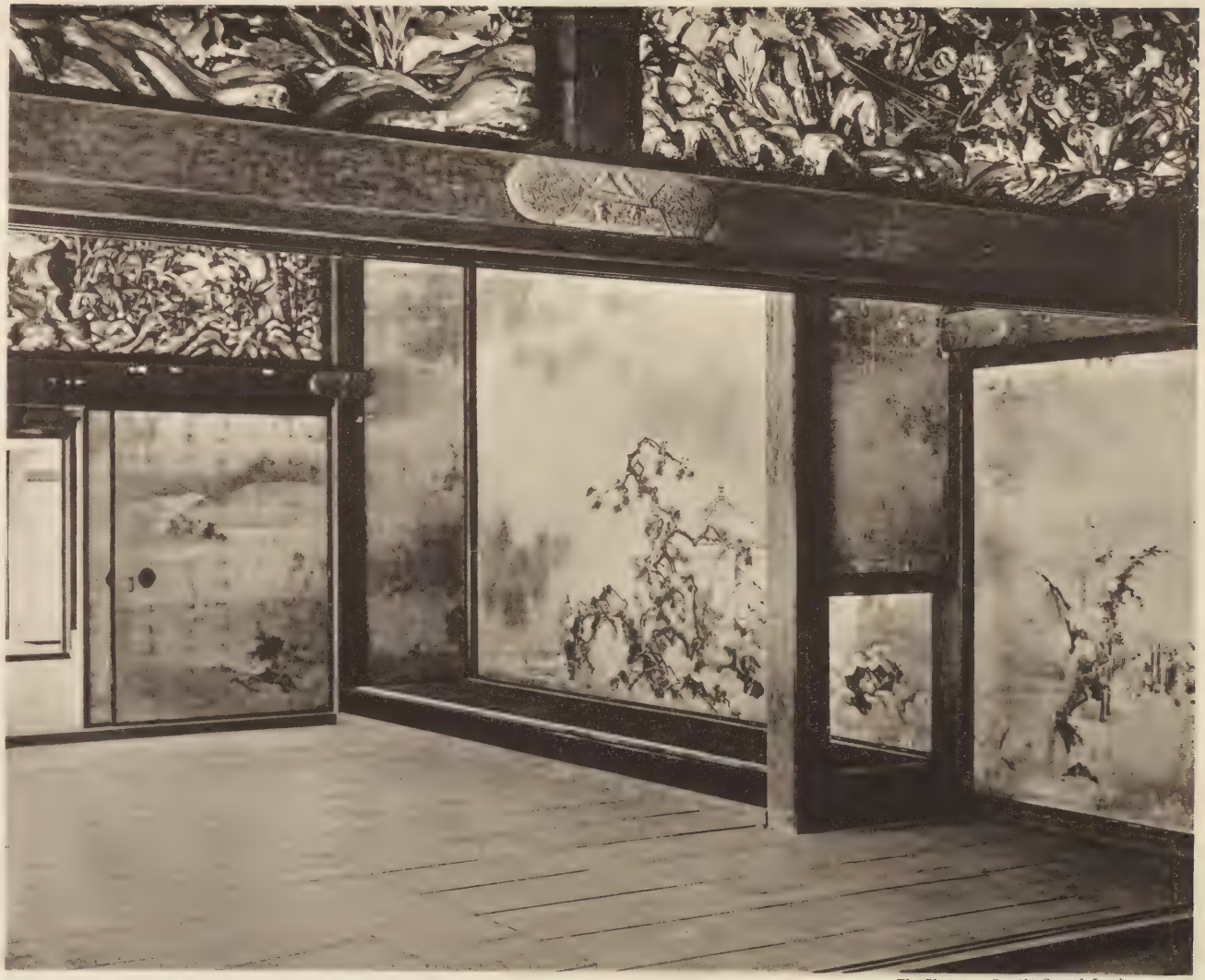
C. F. KELL, PHOTO LITHO, 8, FURNIVAL ST. HOLBORN E.C.

DIFFERENT ARRANGEMENT OF SHELVES IN RECESSES.

REPRODUCED FROM A JAPANESE DRAWING.

(Pages 106, 108 &c.)

XXXI. DOMESTIC ARCHITECTURE IN JAPAN. (xxix).



The Phototype Co., 308, Strand, London.

INTERIOR, SHOWING THE TOKONOMA, VENTILATING FRIEZES, DECORATED SLIDES, &c.

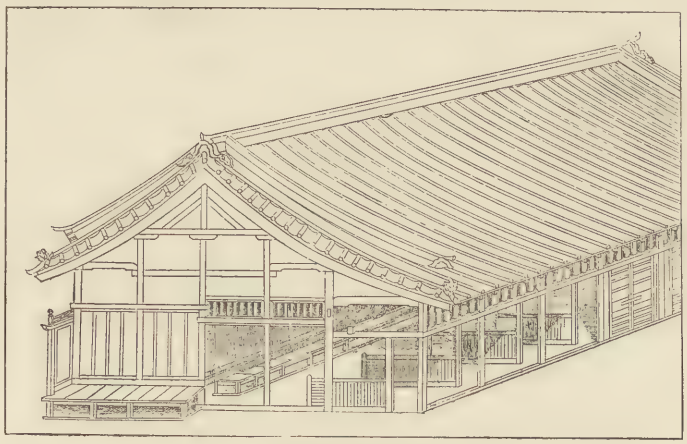
XXXI. DOMESTIC ARCHITECTURE IN JAPAN. (xxx).



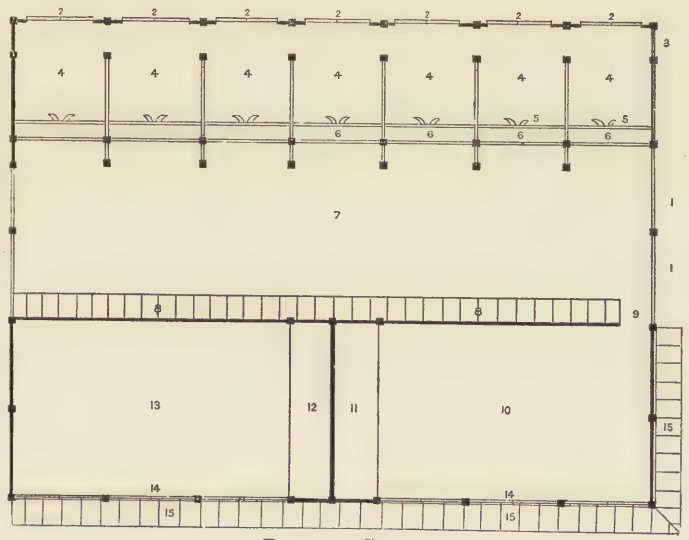
The Phototype Co., 303, Strand, London.

A GENTLEMAN'S HOUSE AND GARDEN.

Those portions of the inclosure not occupied by buildings are surrounded by a high mud-and-tile wall with occasional doorways for special use. The construction consists of layers of mud with occasional courses of flat tiles to bind the material together; the faces are afterwards plastered, and the whole crowned by a little projecting tile roof. Outside the walls and out-buildings runs a cutting, varying from a small stone gutter, to, in some instances, a stone-flanked moat of twelve or fifteen feet in width. A stone causeway or stone slabs laid across the gutter give approach to the gateways.



View of Stable.



Plan of Stable.

1. Entrance Doors; 2. Folding Doors; 3. Door; 4. Stalls; 5. Hooks for Halter; 6. Beam shown in perspective: 7. Covered Exercise Ground; 8. Raised Gallery; 9. Door; 10. Room for Attendants; 11. *Tokonoma;* 12. Recess for Shelves; 13. Room for Grooms; 14. Paper Slides; 15. Outside Gallery.

Nobles of secondary importance invariably combined the gateway and *Nagaya* in one building. The porter's lodges on each side of the gate project in the same way, but are crowned with roof gables of two straight slopes in place of the double curved form used by the first class nobles. In other respects there is but little difference. As a sign of still inferior rank the porter's bay is roofed with the simple lean-to; and in the smallest manors, belonging to vassals of little importance, the projecting bay ceases to exist and the gate-keeper's look-out consists of a little grilled window projecting on brackets. These last buildings are seldom more than twelve feet wide from front to back, and very low; the *Nagaya* which flanks them is of one storey. For the second and third class gate buildings and *Nagaya* tile-faced walls are seldom used, but the lower portion is weather-boarded and stained black, and the upper portion finished in white plaster. The gate-buildings of *yashiki* are in many instances set back some

distance from the road, so as to form an outer court flanked by high walls. In the space thus left stalls for horses are built on either side.

Within the entrance is a large paved yard, with a long central roadway leading up to the inclosure of the residence itself. This court contains numerous separate buildings devoted to various purposes. The officer of building-works, the financial officer, the doctor, the chief steward, and others are here accommodated with separate houses called *Naka-nagaya.* There are also fire-proof stores for valuables; stores for palanquins; for rice, fuel, &c.

The principal residence itself is a reproduction on a small scale of the castle palaces which will be described. A projecting porch, about twelve feet square, leads to the raised entrance hall, where an officer used always to sit before a low table for the purpose of receiving guests. Near the hall is a guard-room, and other guard-rooms are scattered about in various parts of the building. The hall leads to a suite of waiting-rooms from which a verandah-gallery conducts to the private reception rooms and large audience hall behind. Each *yashiki* has one large audience hall, generally of one-hundred mats, or eighteen hundred feet in area, with a raised daïs and handsome ceiling. There are separate suites of rooms for the ladies of the household, and others for pages and attendants, besides a large kitchen, servants' offices, bath-rooms and closets. The interior arrangement is divided by small inner-courts and gardens and, behind, the grounds are laid out in handsome gardens with lakes, rockeries, and plantations. The whole palace is surrounded by a mud wall, or wooden fence, as a screen and partial defence in case of need. The general treatment and decoration of the interior is of the same kind as that of the castles, but on a smaller scale.

In addition to these town mansions, situated mostly within the castle fortifications, there exist, in suburban parts, summer residences which also belonged to the *daïmio.* These residences have large grounds, and charming gardens. In arrangement they do not differ very materially from the best class of dwelling houses described; but they are more spacious, and sometimes portions are of two or three storeys in height. The military character is almost entirely lost.

MILITARY PALACES.

This brings me to the highest class of official residence, next to the Imperial Palace itself, namely, the *Ô-shiro-goten,* or palaces of the Military Regents who for several years were practically the rulers of Japan, the Mikado being kept in almost total seclusion at Kyôtô. The Shôgun's Palace consists of an extensive group of one-storeyed buildings, compactly arranged, and divided by inner courts or small gardens [Illustn. xxxi]. The principal palace of the latest Shôgun, in the Castle of Yedo, which was burnt to the ground, covered an area of more than two acres. The military character of such buildings necessitated greater compactness in planning than was adopted in the Imperial palaces; and whereas the latter, as may be seen in Kyôtô, consist of a number of almost detached blocks connected by long covered ways, the former were more under one roof,

the succession of rooms was less broken, and the inner courts and gardens were introduced only where absolutely necessary for purposes of light and ventilation.

In the castle-palaces such as we are describing, a large public ante-room or hall is first reached from the entrance porch, and this is called the *Genka.* Here used to sit the officials whose duty it was to receive visitors; and adjoining this hall are small rooms for accommodating a military guard. From the *Genka,* or Hall, a corridor conducts to a suite of waiting-rooms called *Shô-in,* into which visitors were first conducted, and from these another corridor or verandah leads round an internal garden to a large audience hall, and an inner suite of ceremonial reception rooms. The audience hall, called *O-Hiroma,* in area often as much as five hundred mats, was employed for the more public audiences, but the reception rooms were strictly devoted to different ranks of guests [Illustn. xxxii]. The principal or daïs chamber, the floor of which was raised some inches higher than the next, was exclusively used on state occasions by the lord and his suite, and from this state room the successive chambers are each lower by a step, and less luxuriously decorated than the preceding one. Thus, on occasions of ceremony, when intervening slides dividing apartment from apartment were removed, the smaller vassals found themselves at a much lower level than, and at a most respectful distance from, the august presence, and their seniors in rank occupying the more favoured position of the nearer chambers. Each state room has its name fixed mostly with regard to the subject of mural decoration with which it is embellished; such are the Wild Goose Chamber (*Gan-no-ma*), the Willow Chamber (*Yanagi-no-ma*), and the Pine Chamber (*Matsu-no-ma*), and hence the custom in official regulations of indicating the rank of courtiers by describing them as Gentlemen of the Willow Chamber, or of this or that Chamber. From these State apartments passages conduct to various groups of inner rooms which were used for purposes of more private entertainment, banqueting, study, and business. As much as possible plans were arranged so as to obtain a southern aspect for the living rooms, from which the various offices, kitchens, and conveniences were separated by an intervening court laid out as an internal garden. The immense area covered necessitated the constant repetition of such secondary rooms; almost every group of apartments would have a kitchen and scullery with lavatories, baths, and closets.

In most cases the private living rooms of the lord and his family were some considerable distance removed from the reception rooms above enumerated, and connected thereto by long covered ways. This last group would have its own private entrance-porch and hall, generally possessing a separate approach from the outside; the set consisted of several handsome sitting rooms facing the south, with double verandahs, and forming the ante-rooms to bedchambers at the back. Large gardens were laid out on the south side, in the midst of which there was generally a group of tiny tea-drinking rooms or arbours.

The principal rooms of the castle palaces are decorated with mural paintings executed by the best artists of the period. The paintings are on silk or paper, and attached to the walls, slides, and ceilings [Illustn. xxix.]. The particular function of the different chambers determined to some extent the style of painting; and in most cases each room would have only one subject of decoration, treated in a variety of different

compositions. The *Gan-no-ma*, or Wild Goose Chamber, for example, is painted entirely with wild geese, some stalking among the reeds, some swimming upon broad sheets of water, others flying among the clouds, and the whole connected by means of uniting lines of landscape. The principal pillars and beams of the rooms show the natural silver grain of the native white pine of which they are constructed, scrupulously selected to be free of knots : the light frames of the slides and the shelves, and the raised recesses are mostly lacquered in brown or black. The ceilings are either panelled in the same white wood, divided into tiny coffers with carved cornices, or are more boldly separated into painted panels by means of thick ribs, lacquered black, and ornamented with gilt metal clasps. The frieze-like spaces of the wall, between the cornice and the lintols of the slides, are often filled in with wooden panels of pierced carving called *ramma ;* these are in some cases geometrical trellises, but in others, naturalesque carving representing birds or dragons is employed. Painting and gilding are often applied to such carving. It may be observed that the application of colour and gilding to the carved wooden friezes, and of black lacquer to the ceiling ribs, is often found in these castle-palaces, whereas in the Imperial Palaces white, wood unpainted and unlacquered, is preferred. In the former, highly decorated as they are, a somewhat curious contrast is produced by the wall posts and cross beams, which show invariably the bare white wood.

The floors of all living rooms are covered with the woven rush mats or *tatami ;* those of verandahs and halls are of polished or lacquered boarding.

The military nature of these palaces is to be seen in a degree of solidity of construction unusual in purely domestic buildings. The pillars and beams are of considerable diameter, and the buildings are never more than one storey in height. The style of decoration followed is consistent with this idea of massiveness, and painting or other ornament is generally of a very bold character. Inferior rooms too common to be decorated with paintings are adorned with wall-papers bearing the heraldic crest of the house, to a large scale.

The immense number of personal attendants and officials, as well as of armed retainers, which the old feudal system entailed, are provided for at the rear of the principal apartments by large groups of administrative offices, having separate gates and entrances; in addition to which are large barracks for an increased body-guard of warriors in times of disturbance. The ladies' quarters are separately arranged behind the private or inner palace, and are very extensive. A high surrounding wall, with complicated and circuitous entrances, and numerous guard-houses, still further protects the whole palace, already well vallated by means of the numerous rings of fortification encircling the central *enceinte* of the castle.

Few of these castle-palaces have survived conflagration ; and the rebuilding of them, which was a matter of constant occurrence in the old days, has naturally ceased with the death of feudalism. A fine example remains in the Castle of Wakayama, and a portion of one in the Castle of Nijo at Kyôtô. Yedo has long lost the two palaces which existed within her castle walls.

I have with some difficulty obtained plans of two palaces, formerly situated within

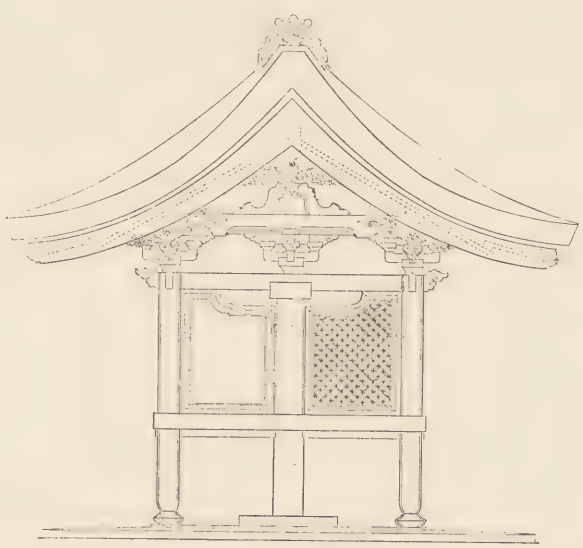
the Castle of Yedo. The principal palace, built in the citadel called Hon-Maru, was the chief residence of the Shôgun. The other palace [Illustn. xxxi.] was built in the western inclosure called Nishi-no-Maru, and was used as a secondary palace in case of accident to the former. It was sometimes occupied by the Regent's eldest son. It was in this palace that the present Mikado first lived after the restoration, the Hon-Maru Palace having been burnt to the ground; soon afterwards this palace likewise shared the same fate. Slight differences occur in the arrangements of the two palaces.

IMPERIAL PALACES.

The arrangement of the palaces (*gosho*) of the early Emperors was adopted from China, in the middle of the seventh century. Eight government offices and other secondary buildings formed a group around the Imperial residence, and the whole was inclosed by a wall of seven miles in circuit with many gateways. Minor inclosures separated the palace proper and the different government departments. At the commencement of the military regime the executive duties of government were assumed by the Shôguns, and from that time until the recent restoration the Imperial Palace has for five centuries been independent of the official buildings. Native historians are on this account accustomed to point to the reduction in the size of the later palaces, but the palatial residence itself, regarded as independent of the government offices, appears rather to have increased than diminished in size. Repeated destructions by fire, and consequent rebuildings are mentioned; and at each reconstruction slight modifications have taken place in these palaces.

I shall briefly attempt to describe the arrangements of the latest palace which still exists at Kyôtô—the former Imperial capital [Illustn. xxxiii].

This Palace consists of seven principal blocks of residential buildings, connected by covered corridors, and arranged in an irregular manner, so as to present the best aspects to the wide gardens and courts surrounding them. At the back of these buildings are large groups of administrative offices, and at various parts of the inclosure are fire-proof stores and outbuildings. A special block is arranged for worship, originally also intended as a repository for certain sacred treasures.



Imperial Gateway.

Without stopping to describe the different gateways (of one of which I have given a sketch-elevation), through which the inclosure is entered, I shall refer first to the principal blocks within. The first

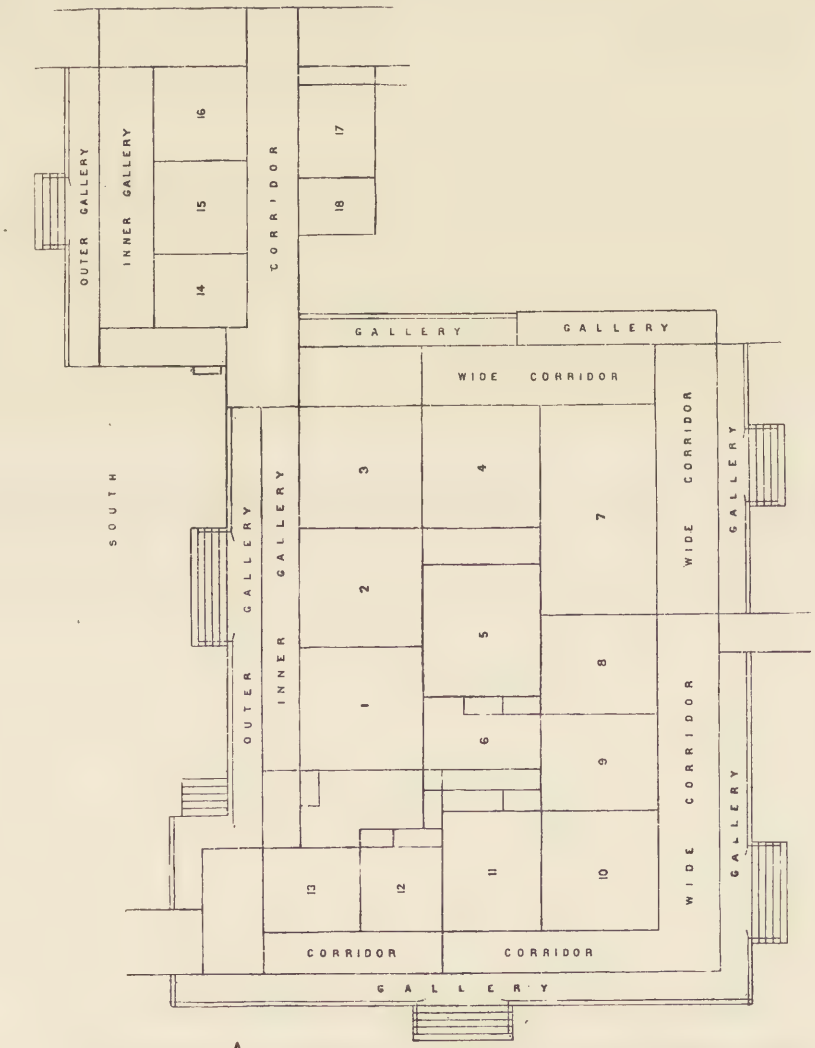
group reached is the *Shi-shin-den,* or ceremonial hall, which is used only on special occasions [Illustn. xxxiv]. It is a large boarded hall, measuring about 100 feet by 50 feet, with a wide corridor behind, and recessed galleries at the sides. At the back it is connected with a passage leading to the Imperial chambers, and in front, towards the garden, has a broad flight of steps communicating with an exterior railed gallery. Upon the slides at the back are old painted portraits on silk of ancient Chinese sages, reproductions of the work of a famous old painter named Kanaoka. The court in front of this hall contains several store-houses for the Imperial cars, palanquins, and other ancient utensils; and, immediately before the threshold, are two sacred trees to which great antiquity is attributed. The next block reached from the outside, and more towards the west, is the *Serioden,* or Summer Palace, which is a building only used for special summer ceremonies, and not matted as all purely residential buildings are. When occupied by the Emperor a portable mat, called *michôdai,* was used as the Imperial seat, or Chinese chairs were employed. The courtiers, and even the Shôgun himself, on such occasions, sat upon the boards. The corner of the largest room contains a curious sunken cemented floor, upon which certain oblatory rites were performed by the Emperor. On two sides of this hall are small chambers used as retiring rooms, and a large lavatory and bath-room. The side rooms are named mostly according to their decoration; thus we find indicated the Wisteria Chamber, the Lespedeza Chamber, and the Fiend Chamber. There is also a small chamber devoted to ceremonial repasts, which is used in the Chinese style, and on occasions furnished with a raised table and chairs,—a manner of employment not found elsewhere in the palace or other dwellings of the old style, where all food was taken in a seated position on the floor. In front of the block is a double boarded gallery, the inner division being of great width. Three flights of steps give access to the garden. A little artificial stream runs round the front portion of the building, crossed opposite to the gallery steps by small stone bridges. This is used for a favourite summer amusement, called *kiokusui,* in which little cups of wine, called *sakazuki,* are floated down the stream.

On the opposite side of this court, and behind the *Shi-shin-den,* is the *Kogosho,* or Small Palace, having its principal aspect towards a garden on the east side. It consists merely of three matted rooms of eighteen mats in area (or 17 feet 6 inches square), with a very wide inner gallery, an outer balustraded gallery with steps on the garden side, and smaller side galleries. It must be remembered that for the imperial buildings a mat of about 7 feet in length, larger than that employed in ordinary buildings, is used; and the *ken* standard of measurement, which is usually 6 feet, is therefore here increased to 7. None of these rooms contain the recesses and shelves common to the best class living rooms; they are in fact merely day chambers for the Emperor's use on special occasions. The walls and slides are richly decorated in cream colour and gold, with paintings of landscapes and figures in pale colours, interrupted by cloud-shaped streaks of rich blue.

The next block reached on the garden side is called the *Gakumonjo,* or Imperial

Study. It contains six rooms of varying size, three of which are provided with ornamental recesses. Round three sides of the block runs a matted gallery called *Ô-yen-zashiki,* which is a favourite place for sitting in in the Summer. There is still an outer boarded gallery communicating with the garden steps. Some of the chambers are described as Wild Goose Chamber, Crysanthemum Chamber, and Yamabuki Chamber. The three front rooms form a suite, increasing in elegance towards the east; the innermost room has a slightly raised floor and a richly recessed ceiling. The general system of wall decoration is that of a cream-coloured ground, spotted with gold, and painted with figure subjects, birds, rocks, and water in bright colours.

Next in order comes the *Ô-Tsunegoten,* or Imperial residence proper, which is a large block of rooms measuring about sixty feet by one hundred feet, and with a small corner



1. Emperor's State Room; 2, 3, 4. Ante State Rooms; 5. Emperor's Bedroom; 6. Guard's Room; 7. Reception Room; 8, 9. Sitting Rooms; 10, 11. Drawing Rooms; 12, 13. Private Rooms; 14. Emperor's Private Meeting Room; 15, 16, 17. Ante Rooms; 18. Private Dining Room.

PLAN OF THE Ô-TSUNEGOTEN, OR PRINCIPAL BLOCK OF ROOMS, IN THE IMPERIAL PALACE, KYÔTÔ [ILLUSTN. XXXIII].

block attached. It consists of fourteen rooms, arranged in an oblong block, and surrounded by a wide passage, and an outer gallery thrown open in the Summer time to the breezes. On the south side is a suite of three rooms, the floor of each successive room being raised above that of the other. The end room, which is the highest of the three, contains a small raised daïs of mats in the centre, indicating the position of the imperial seat. The wall at the back of this raised seat is fitted with handsome slides having their frames heavily lacquered and fitted with bronze, the panels gilt, and painted with representations of the mythical bird called *hô-wô*, with its gorgeous plumage. These slides open into a small room at the back, surrounded on all sides by other chambers arranged for purposes of protection; for here were kept the Emperor's regalia and personal treasures. The walls of this little room are decorated with the blossoming trees of Spring and Summer, painted on gold-sprinkled backgrounds. The larger rooms are furnished with handsome recesses, shelves, and cupboards. The mural paintings represent scenes from Chinese history, landscapes, architectural groups, and animal life, the setting to all being rich gilding. At the side of, and approached from, the Emperor's sitting-room, is the sleeping apartment, which is placed so as to have rooms on every side of it. The panels of the walls and screens are painted with life-size representations of tigers amidst bamboos and rocks. The ceilings, like the posts and beams supporting them, are of clean white wood, ornamented with engraved metal nuts and clasps. Many buildings destined for far less important uses are to be seen in Japan with gorgeously decorated ceilings; but a neat simplicity and elegance is all that these Imperial chambers can boast.

In front of the principal rooms is the matted corridor, or verandah, with an outer balustraded gallery, and steps leading to the gardens. The palace gardens are laid out in a stately and picturesque manner, but not with the broad grassy slopes and formal *parterres* of flowers to which we are accustomed in European palaces. Artificial lakes, with quaint bridges and islets; moss-covered hillocks; sandy stretches, with well-trained trees and shrubs; stone lanterns, and rare rocks and stones distributed in picturesque groups, are the most characteristic features.

The next building of importance, approached from the *Ô-Tsunegoten*, comprises a little group of four rooms, called *Norioden*, or *Go-Noriosho*, and used for enjoying the cool breezes in the summer time. The largest room is only four mats in area, or about eleven feet by fourteen feet, and its height and proportions are all on a small scale. It boasts the most picturesque features of a Japanese room in the form of ornamental recess and tiny latticed oriel, and is decorated with landscapes. The posts, beams, and ceilings are of beautiful white wood delicately framed; and a little lacquer is introduced in the floor border of the recess and in the frames of the slides. A boarded gallery or verandah runs round the two principal sides of the block.

Beyond this building again, on the occasion of a personal visit, I observed a group of tiny chambers not shown upon the present plan, but bearing the name of *Chosetsutei*. These rooms form, in fact, a sort of summer-house for the purpose of tea-drinking, and in their miniature proportions and light construction are a true type of the *Cha-shitsu*, or tea clubs, which one finds connected with most large domestic buildings. The acme of



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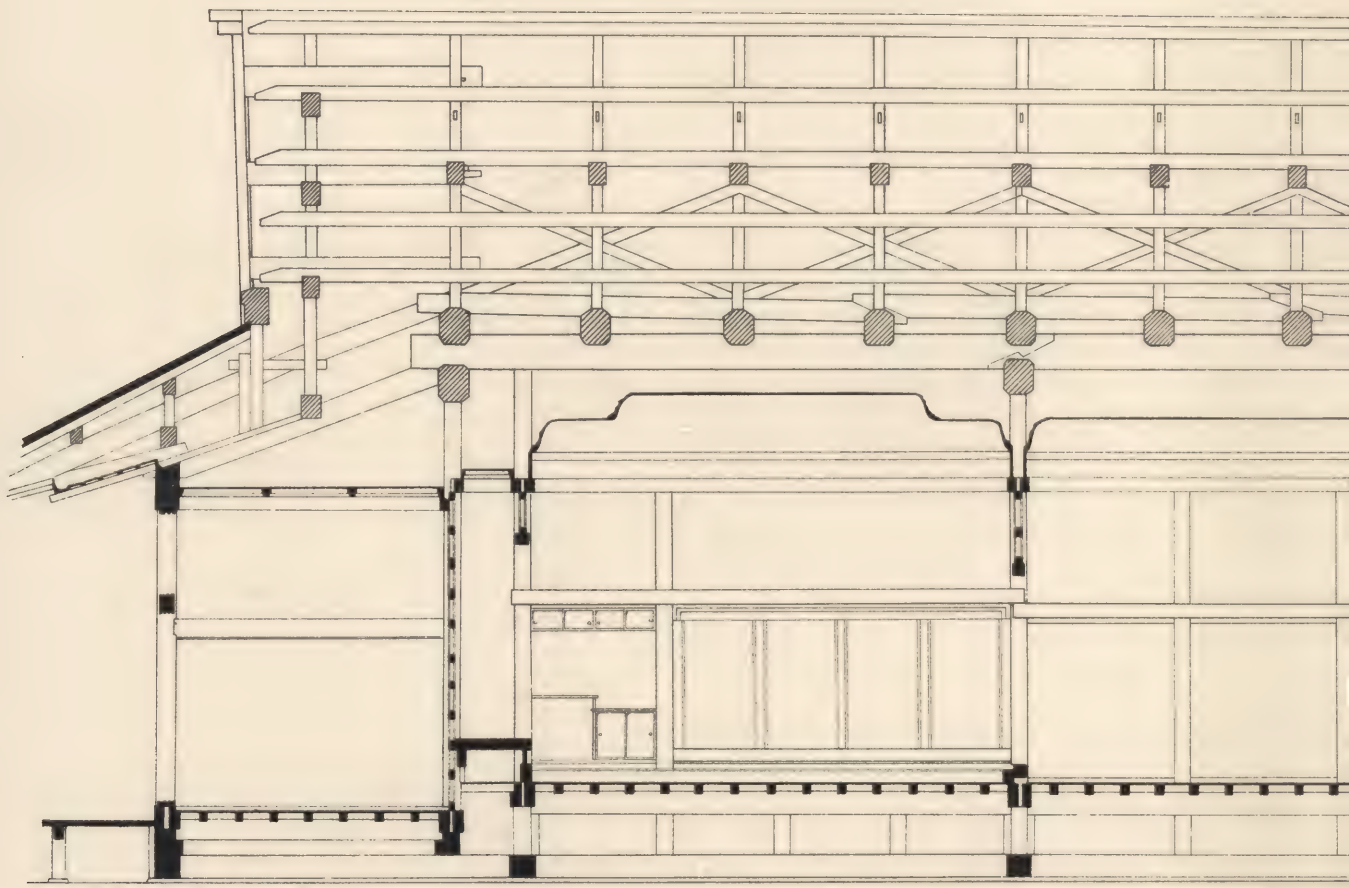
PLAN OF NISHI-NO-MARN PALACE, WITHIN THE F



C.F.KELL LITHO, 8, FURNIVAL ST. HOLBORN, E.C.

TIFICATIONS OF TOKIO CASTLE (NOW DESTROYED).

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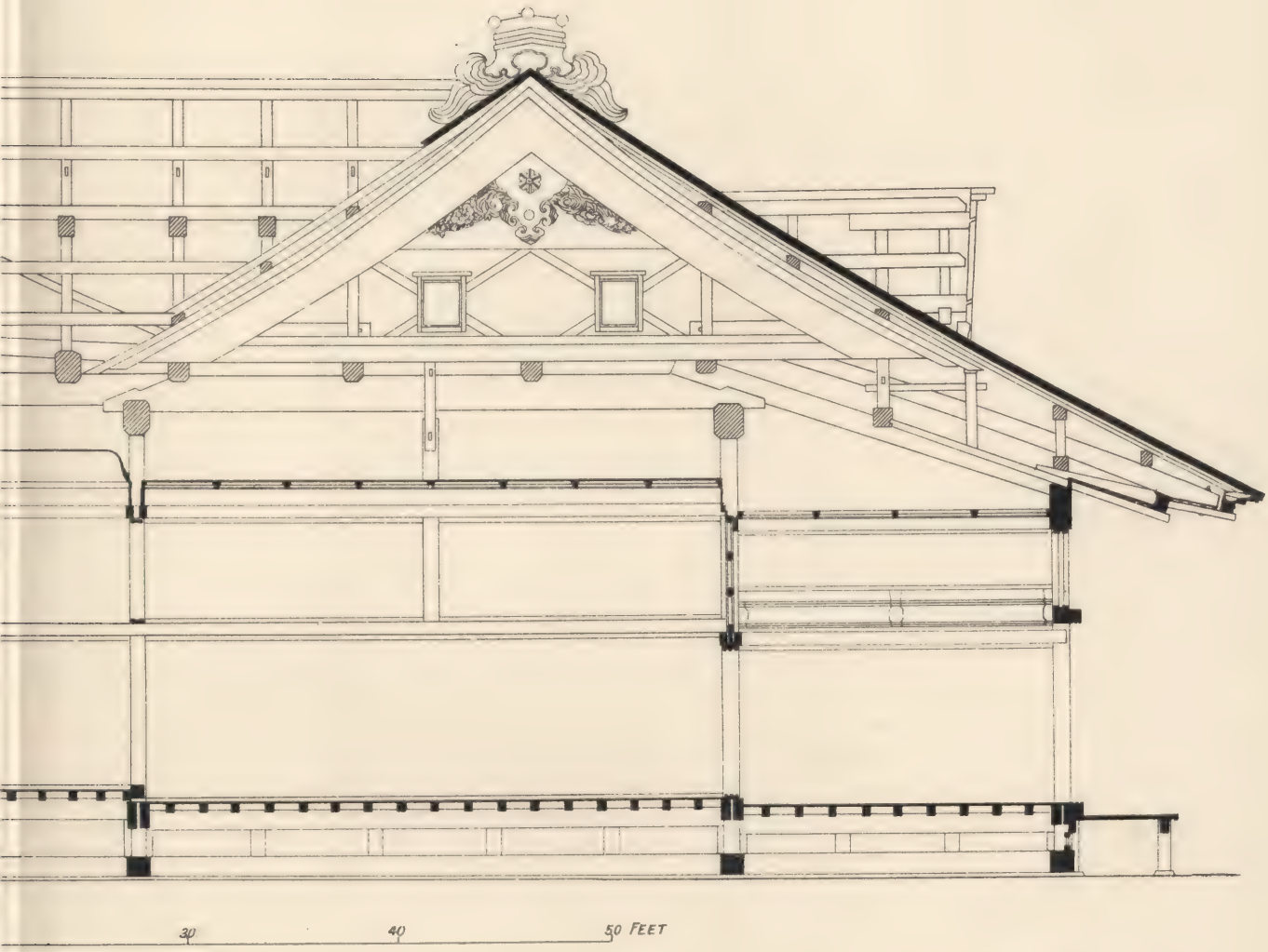
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SCALE OF 10 5 0 10 20

PART SECTION, PART ELEVATION OF THE O-HIROMA, OR AUDIENCE HALL

REPRODUCED FROM A JAPANESE

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C. F. KELL. PHOTO. THO. R. FURNIVAL. ST. HOLBORN. E. C.

IN THE PALACE OF THE MILITARY REGENT, TOKIO, (NOW DESTROYED).

CARPENTER'S WORKING DRAWING.

61).



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PLAN OF THE IMPER

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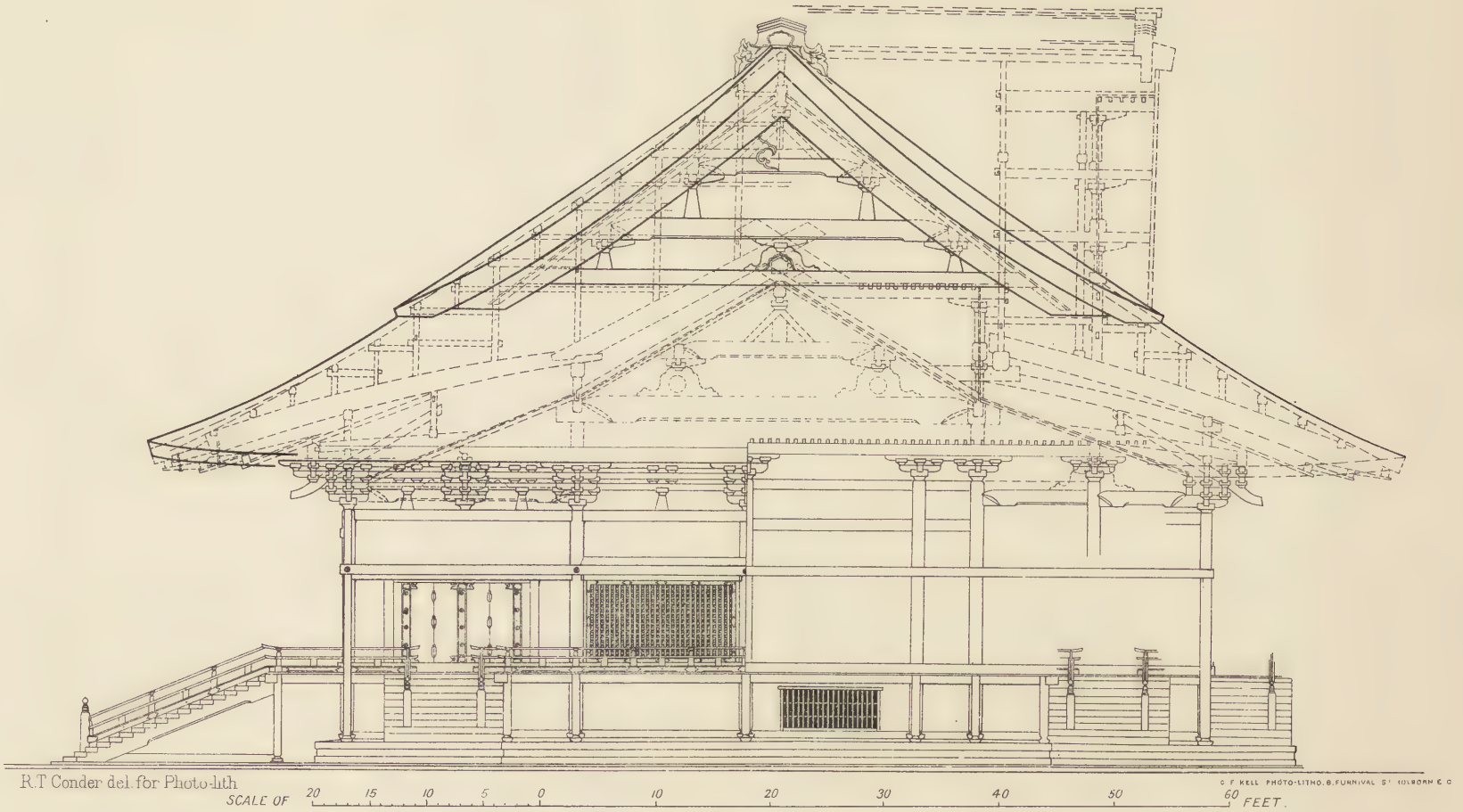


L PALACE AT KYOTO.

118)

C.F.KELL LITHO. 6 FURNIVAL S^T HOLBORN, E.C.

XXXI. DOMESTIC ARCHITECTURE IN JAPAN. (xxxiv).



PART SECTION, PART ELEVATION OF THE SHI-SHIN-DEN, OR CEREMONIAL HALL, OF THE IMPERIAL PALACE, KYOTO.

REPRODUCED FROM A JAPANESE CARPENTER'S WORKING DRAWING.

(Page 118)

pleasurable idleness is to sit in such fairy-like rooms, open to the spring winds, and looking out upon the blossom-clad country.

I have not as yet alluded to a block of rooms situated to the east of the *Shi-shin-den*, or ceremonial hall, and called *Naishi-dokoro*. It is connected by a large corridor with the main palace, and the nearer portions of it may be described as an Imperial oratory or temple, consisting of an Imperial chamber, with a raised boarded floor, and two adjoining sanctuaries, called respectively the outer and inner sanctuary. In ancient times such a building contained ancestral relics, but these are said no longer to be kept in the *Naishi-dokoro*, but in the Shintô temples of *Ise*. It is used for certain periodical services of ancestral worship conducted by the Emperor. At the back are rooms intended as the special residence of a class of Imperial female attendants called *Nai-shi*, of a semi-religious character, whose duties were originally associated with the charge of such sacred treasures, and who still remain as important officials of palace ceremonial. Near to this block are various outbuildings serving as stores for musical instruments, books, and utensils. There are also detached buildings for musicians, watchmen, building officers, etc.

On the western side of the principal Imperial chambers are extensive apartments for officials and servants, for kitchens, sculleries, wardrobes, firing rooms, and stores. On this side too, are the principal private entrances to the palace. The Imperial entrance, opposite to a fine outer gate called *Kara-mon*, is under a large carriage porch behind the *Seirioden*, from which wide corridors lead direct to the more private parts of the palace. More to the north, and set back in a courtyard, is a visitors' private entrance, leading to a suite of waiting rooms behind the *Ô-Tsunegoten*. Still further to the north are large barrack-like buildings, intended for low-class officials and inferior domestics.

Other outbuildings on the west side of the inclosure, just within the kitchen gate (*Dai-dokoro-mon*), are as follows:—porters' quarters, messengers' quarters, guides' quarters, gardeners' quarters, waiting rooms for merchants, building office and workshops, tool houses, and fire-proof stores for provisions and valuables.

The whole of the Imperial buildings are, without exception, of one storey only, and present very few striking architectural features on the outside. It appears to have been one of the aims of the palace builders to preserve as much as possible the most ancient forms and manner of construction in the exterior, whilst admitting the application of modern painting and finishing in the interior. The roofs are of picturesque curve, though decidedly heavy looking, and are covered with thick layers of pine shingles. Terminals and ridges are executed in wood, covered with copperplate, and with a little gilding in parts. The gables have barge boards and carved pendants. The eaves, which in temple buildings are very elaborate and supported by a rich bracketed cornice, are, in most palatial structures, much simpler. A striking exception is in the case of the *Shi-shin-den*, which partakes more of the religious character, having a heavily bracketed cornice of the temple type. The principal features of interest upon the exterior of the palatial buildings are the elegant balustrades and handrails of the external galleries and staircases, and the wooden screen divisions which separate the verandahs into parts. These last

consist of elegant frames containing handsome wooden doors, painted with various subjects of decoration. The vista of interior rooms, always seen from the outside, attaches interest to an otherwise bare and monotonous elevation.

Though these Imperial buildings are of one storey only, the floor is considerably raised from the ground, sometimes as much as four or five feet, and a considerable amount of ventilation is admitted through barred gratings below the galleries. This height of floor is a special characteristic of the better class Japanese residences, but no idea of ever using anything so damp and cheerless as a basement ever seems to have existed. The interior rooms average about twelve feet in height, in addition to which extra height is obtained in the superior rooms by recessing the ceilings in various ways.

The complete group of buildings is surrounded by an irregular oblong fence, constructed of clay and tiles set in heavy wooden framing, and plastered between the frames. This fence is crowned by a wide and picturesque tiled roof with ridge ornaments. At certain points in the boundary are gates, each of some different design, and intended for special uses.

The longer side of the enclosure measures about 2400 feet, and the narrower side measures about 1440 feet. Taking into account certain depressions, the whole boundary measures about 8436 feet, or nearly $1\frac{3}{4}$ English miles.

SUMMER PALACES.

In various parts of Japan, and notably in the precincts of the ancient capital Kyôtô, exist certain buildings, sometimes described as summer palaces, but which are perhaps more correctly named summer pavilions. Such are the buildings called *Kinkakuji*, *Ginkakuji*, and *Hinukaku*, all associated with the names of some great Regent or Emperor, These buildings were used as temporary residences for retirement, and have no official character whatever about them. They are of two or three storeys in height, contain small painted chambers of great delicacy and beauty, and are surrounded by magnificent gardens.

Having thus touched upon the subject of the domestic and palatial buildings of Japan, it is necessary to make some allusion to the more important public buildings of the towns. Among the principal of these are the bath-houses, tea-houses, restaurants, inns, lodging-houses, theatres, lecture rooms and dancing rooms.

HOUSES OF PUBLIC ENTERTAINMENT.

Baths.—In Japanese towns even the poorest quarter is provided with one or more bath-houses. To the Japanese people the hot bath is a refreshment of almost daily requisition, poor and rich alike studying habits of personal cleanliness, from which some Westerns may well take lessons.

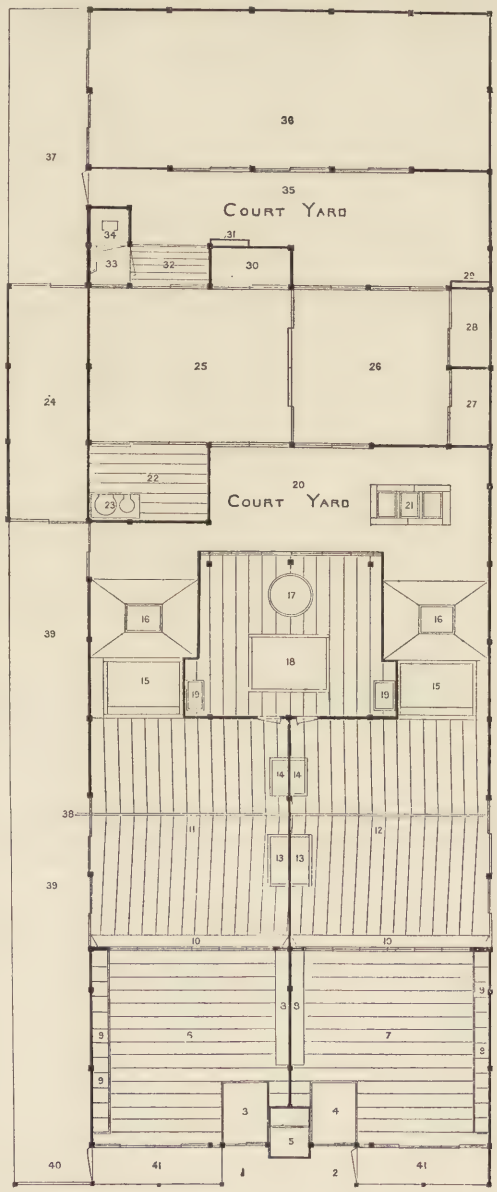
The plan I have obtained is a typical one, and shows a building effectually divided down the centre for the purpose of separating the sexes; and the arrangement with the exception of the fuel-room and proprietors' quarters is exactly a duplicate one. In the front are two entrances, one for men on the right and one for women on the left, separated

by a door-keeper's lodge in the centre. Each entrance lobby leads to a boarded ante-room or dressing-room, about 15 feet square, containing numerous lockers for clothes and shelves for clogs and sandals. The further end of this room has large slides communicating by a step down, with a bath-room boarded and drained. Here a large number of bathers can be accommodated, and can be supplied with pails of hot water for the purpose of commencing or finishing their ablutions be-



Public Bath House.

fore and after immersion. This bath-room has at the side hot and cold water tanks from which the bathers bail what water they require. At the further end of this room is the hot bath for immersion, measuring about 5 feet square, and into this two or three persons can enter at a time, to undergo the temporary process of immersion or rather of boiling. The smallness of the bath, in proportion to the large drained bath-room, will be better understood if it be remembered that the hot bath is kept at a very high temperature, and that little or no actual scrubbing, soaping, or washing takes place within it. It is merely for a short immersion, after which the bathers retire to the washing-floor to finish their operations with clean hot and

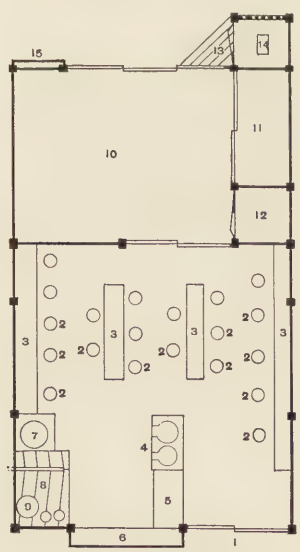


1. Women's Entrance; 2. Men's Entrance; 3, 4. Earth-paved Vestibules; 5. Door-keeper; 6, 7. Boarded Dressing-rooms; 8, 8. Shelves for Clogs; 9, 9. Closets for Clothes; 10. Step-down; 11. Women's Bath-room; 12. Men's Bath-room; 13. Cold-water Tank; 14. Hot-water Tank; 15, 15. Hot-water Baths; 16. Cowl over Furnace; 17. Well; 18. Water Tank; 19, 19. Hot Water (clean); 20. Court-yard; 21. Dust-bins; 22. Kitchen; 23. Range; 24. Small Store for Fuel; 25. Dwelling-room (10 mats); 26. Dwelling-room (8 mats); 27. Closet; 28. Closet; 29. Shutter-box; 30. Closet; 31. Shutter-box. 32. Verandah-passage; 33. Urinal; 34. Privy; 35. Court-yard; 36. Store for Fuel; 37. Back Passage Entrance; 38. Outlet to Drain; 39, 39. Side Passage; 40. Side Entrance; 41. Front Garden.

cold water. The hot bath also has within reach a small tank of clean hot water used only with a ladle for washing the head and shoulders during bathing. The heating of the bath is ingeniously arranged by means of a primitive kind of boiler, surrounding a metal furnace, which has over its mouth a large hooded chimney. Firewood is used for fuel. At the back is a large reservoir for supplying the boilers, and behind this again is a large ash-bin, situated in a court-yard. At the back of this court-yard are certain dwelling rooms, a small kitchen, and also a large store for fuel. On the elevation it will be observed that privacy is obtained for the dressing-rooms facing the street by means of a high fence surrounding a strip of garden. There is, at the side of the building, a wide passage leading to the back of the premises.

Restaurants.—The gastronomic wants of the people are provided for, as with us, by means of public buildings of different classes of respectability, from the commonest eating house to the large inn or hotel. Mentioning such buildings in the order of their importance, the commonest is the *Meshi-ya,* or eating-house, then come various kinds of restaurants, called *Riyori-ya,* then the *Chaya,* or so-called tea-houses, and last the *Yadoya* or hotels. In addition to these are the *Machi-ai-no-chaya,* well known by the young sparks of society, and specially intended for private entertainments by appointment. The common *Chaya,* or tea-house, must not be confounded with the buildings formerly described as specially devoted to tea drinking, and called *Chaseki* or *Chashitsu.* The term is one implying a kind of hotel which has not the right to sleep travellers, but only to entertain during the day time.

A third-class restaurant is shown in the diagram. Taking the plan of a *Riyori-ya,* or ordinary restaurant, it is found to be entered by a central projecting porch leading to a corridor, central hall and staircase. The principal rooms below, on the left of this entrance, are for management. There are the office, the counting house, the kitchen, scullery and room for the preparation of food, two rooms for the proprietor's family, and a fireproof store partly detached. At the back of this left wing is a detached bath room, approached from the garden and served from the kitchen side. To the right of the hall are six large and two small rooms for visitors. The largest of these rooms are of ten mats or 180 square feet in area, and the smallest only four mats, or 72 square feet. Verandahs are freely provided, and each room has its alcove (*tokonoma*), and shelf recess (*tana*), or closet (*todana*). Conveniences provided with ornamental water basins are distributed in several places, in a manner so as to cut off the smell as much as possible from the rooms. The upper storey of this building has a specially large room called



PLAN OF A THIRD-CLASS RESTAURANT. [77]

[77] 1. Entrance; 2. Seats; 3. Tables; 4. Range; 5. Cupboard; 6. Food Shelves; 7. Wine Shelf; 8. Sink; 9. Water Pail; 10. Living-room; 11. *Todana;* 12. Closet; 13. Verandah; 14. Privy; 15 Shutter-box.

Ô-Hiro-ma (literally wide room), of twenty-four mats in area, intended for large parties. It has its *tokonoma, tana,* and a wide verandah, and it is provided with an ante-room. There are also four more rooms of average size, with recesses, shelves, and store-closets. It would do some of our lady clients' hearts good to see how luxuriously all Japanese buildings are provided with cupboards and closets, which are generally used to hold quilts, cushions for sitting upon, fire boxes, candlesticks, and other utensils required. As would be expected in a restaurant, the kitchen is of considerable size. One corner contains a well with raised border, surrounded by a drained floor for washing purposes; near to this is a cooking range, and on the opposite side is a row of charcoal stewing stoves and a dresser; the whole of the kitchen floor is boarded. Adjoining is a partly-matted room in which the food is cut up, and arranged upon little dishes and trays, before distributing to the various rooms.

Tea-houses.—Of the *Chaya* or tea-houses there are several classes, showing considerable differences in details, and I have selected for reference one of the so-called theatre tea-houses, these representing upon a small scale the best class of such buildings.



Elevation of a Tea-house.

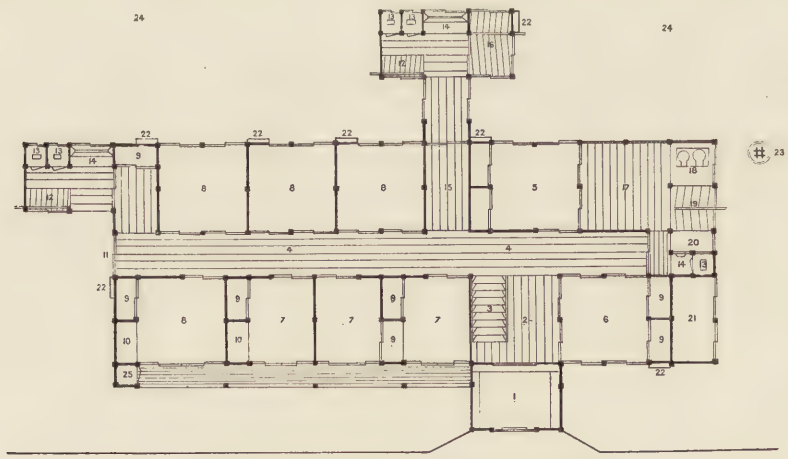
A theatrical performance in Japan taking up the greater portion of a day it has become customary to surround a large theatre with a number of these tea-houses, with the object of providing refreshment to playgoers. Through the managers of these houses, tickets are obtained for the play; and the visitors to the theatre are, so to speak, taken charge of by one of these establishments. It is at his tea-house that a respectable playgoer at first presents himself; here he is refreshed, from here accompanied to his seat, and accompanied back again for further refreshment, in the intervals and at the end of the play. It is here that he receives his little bill, which by this time is sufficiently appalling. There is an attempt now to do away with this tea-house system,

but it is no easy matter, as such establishments have considerable control of the theatres, and provide most of the capital with which the performances are conducted.

The large front room called *Mise* or shop, generally accommodates a little low desk, at which the manager sits at his book-keeping, and leaves a wide matted space for the temporary admittance of guests. The room contains two large *todana,* and a recess for a shrine called *Kami-dana,* which in such buildings is supposed to be conducive to good luck and prosperity in business. The opposite side of this room communicates with a verandah looking upon an inner court or garden. Facing the entrance is a boarded hall, staircase, and boarded passage containing at the back earth-closets, a large urinal and washing place, with fixed screens ingeniously arranged to give as much privacy as possible. Behind are private rooms, with a large kitchen and scullery.

Hotels.—The *Yadoya,* or hotel, has a greater number of small rooms than the *Chaya,* and more accommodation for servants and management. On the right of the entrance is a boarded luggage room, and on the left the general room or shop, with special adjoining rooms for book-keeping and servants. The hall communicates with passages and verandahs leading round inner courts or gardens, and communicating with a number of guests' rooms. There are also kitchen, scullery, bath-room, closets and rooms for female servants. Several little staircases, as well as the main central one, are provided for communicating with the upper floor. On the upper floor are two large front rooms for special entertainments, and nine or ten smaller guests' rooms; in every case provided with the essential closets and shelved recesses. In addition to the bath-room inside the main block there is a little bath-room for private use provided in the garden at the back.

Lodging-houses.—Another class of domestic building to which reference must be



Ground Floor Plan of a Lodging House.

1. Entrance Vestibule; 2. Hall; 3. Staircase; 4. Passage; 5. Common-room; 6. Office; 7, 7. Six-mat Rooms; 8, 8. Eight-mat Rooms; 9, 9. Closets; 10, 10. Tokonoma; 11. Exit to Garden; 12, 12. Washing-stands; 13, 13. Privies; 14, 14. Urinals; 15. Passage; 16. Washing Place (for morning ablutions); 17. Kitchen; 18. Range; 19. Scullery; 20. Kitchen Entrance; 21. Stores; 22. Shutter-boxes; 23. Well; 24. Garden; 25. Closet.

made, is the *Geshiku-ya,* or lodging-house. Such structures are occupied chiefly by students and single men, and consist of a row of separate rooms on each side of a central

corridor, which are let out to different tenants. The example illustrated is an oblong building of two storeys in height. It is entered from a paved porch, or *doma*, through a boarded hall which communicates with the central boarded corridor, and with a staircase leading to the upper storey. The room on the right (8 mats in area) is the office, or room of the proprietor. The room opposite the entrance is used by all the tenants as a common sitting-room. At the back and at the two ends are the ordinary conveniences with lavatories, and a bath room; here the morning ablutions are performed. The kitchen and servants' room is at one end of the back of the block. Most of the living rooms are supplied with store closets (*todana*) which hold the quilts used as bedding. The upper floor is entirely devoted to the rooms of tenants, each chamber having its wardrobe or store closet attached.

Theatres, &c.—The Japanese theatres, which I described in *The Builder* some ten years ago, possess the peculiar feature of an enormous revolving turn-table on the stage, which enables one scene to be prepared in the rear whilst another is going on. In addition to the theatres (*Shibaya*) there are various Music Halls and dancing rooms, the largest and best being the *Miako-odori-ya* used for a special kind of dance performed at Kyôtô. Historical and comic lecturing is also an amusement which draws a large number of the common people; and buildings, which exist for such uses, contain a large audience hall, raised platform, green rooms, and rooms for service. They have rooms also for the preparation of tea which is distributed in small cups to the audience. The cities of Japan have been till lately much wanting in buildings for amusements of a high class, which is chiefly owing to the custom of the better classes having entertainments brought to them in their own houses. Until quite recently no man of position would ever think of going inside a theatre, such resorts being frequented mostly by the lower classes.

JOSIAH CONDER.

XXXII.

OBSERVATIONS ON THE ARCHITECT'S FUNCTIONS IN RELATION TO BUILDING CONTRACTS. By Professor Kerr, *Fellow.*

SOME of the chief practical difficulties of the day in our architectural community arise, as might well be supposed, out of the system upon which building contracts are administered. It will be remembered that, not many years ago, there was a good deal of anxious consultation between a Special Committee of the Royal Institute of Architects (of which I was a member) and the London Builders' Society, the result of which was the settlement of a form of "Conditions of Contract," which has ever since been accepted as satisfactory by perhaps most architects and builders. But still there have been many individual exceptions to this satisfaction, and at the present moment there seems to be a disposition on both sides to renew the discussion. In general terms we may say that what architects are demanding is greater clearness or definiteness, so that they may be able to feel more confidence in the comprehensiveness of the contract; in other words, that certain contractors may not so easily escape from their legal obligations. But builders none the less are demanding exactly the same increased clearness or definiteness; for they also wish to feel more confidence in respect of the precise limits of their obligations, so that certain architects, when disposed to be exacting, may have less arbitrary powers, and the lawyers less facility in introducing into the controversy those paradoxical refinements of their own which are still more inconvenient in such business as building.

My object in the present Paper is not in any way to discuss the Conditions of Contract, but to submit a few observations upon the less superficial aspects of the architect's difficulties; and to advocate the more formal recognition of a kind of liberality of dealing, which I am afraid some of my friends—I hope not many—will at first sight consider to be rather a loose system of dealing with any sort of contracts, but which I take to be nevertheless the way in which these peculiar contracts of building are actually handled by our best men, and, I may say, the only way in which they can be handled with a certainty of success. And, indeed, I do not hesitate to draw a distinction boldly between this system and the hard-and-fast law of the Courts; and to affirm it to be a

distinction which the best lawyers understand thoroughly, and wish us to understand as well.

An everyday contract between commercial men is of course a simple affair; indeed nothing can well be simpler than the sale and purchase of a parcel of goods; and nevertheless the world of commerce is full of controversies and disputes about the most commonplace of these everyday contracts. But when we look at building contracts, we cannot help perceiving a complexity so great that one might be allowed to wonder how they can arrive, as a rule, at anything like amicable completion; and yet we know that they generally pull through somehow, and that there is much less of actual litigation about them than there unfortunately is about much simpler matters. The primary reason is, I venture to say, that they are directed by architects and not by lawyers; I mean, it is the architects who pull them through. Indeed their very complexity is in this respect their safety; for lawyers always dislike them; they cannot handle them either with confidence in the Courts or with credit to themselves. The very language of building is to a lawyer in a most remarkable degree an unknown tongue; so much so that one might suggest, without the slightest disrespect, that there is something in the highly artificial training of the legal mind which particularly refuses to form an acquaintance with a species of business that deals so little with ambiguous generalities.

Consider for a moment what a building contract is; how widely different from a bargain to buy and sell so many hundred tons of coal or pig iron, or so many thousand yards of Manchester manufactures, or even any extent of building property itself, when once the buildership of it is a thing of the past, and all the complications of bricks and mortar have been converted into the simplicity of quarterly rents. For a building contract is really this: not in any way a natural necessity of building-science, but a contrivance, purely commercial, for enabling the proprietor, as a speculator, to escape from the natural uncertainties of his building speculation. To this end in the first place the architect is employed; not merely to devise the design with artistic grace and scientific skill, but to direct its execution with commercial dexterity; and here we may be pardoned for keeping in mind in these days the absolutely unparalleled circumstance that, for the difference between pounds and guineas, this functionary not only creates out of a chaotic collection of raw materials a highly organised structure of utility and elegance, but also performs the supplementary duties of a responsible administrator—for which duties alone any other more commercial man would probably claim the full remuneration he receives. Then, secondly, we see the measuring surveyor or architect-accountant, who, for the consideration of a few pence added to the guinea, measures, classifies, and exhaustively tabulates, all the operations of the construction, so that the builder shall be enabled to estimate the value with minute accuracy beforehand. And, lastly, having accomplished this calculation, the builder is expected to be in a position to relieve the proprietor from his uncertainties, by making a bargain at a fixed price; which price shall at once afford to his customer acknowledged value for his money and provide for himself a reasonable profit for his living. But although all this is sufficiently complex to excite the wonder of any one who takes the trouble to reflect a little, its

complexity is still exceeded by what is to follow. For, in the next place, we have a very remarkable system of competition tendering, by which the contractor is selected on the hazardous ground of rivalry in cheapness; and then it becomes the function of the architect to be the responsible supervisor and adjudicator of his performance of the bargain so arrived at, and this much too frequently in a most painful attitude of suspicion and hostility. Nay, there is even a third consideration that must not be forgotten; for if the matter comes to the strict law of the Courts as against ourselves, I am afraid we must say that this purely commercial and financially responsible supervisorship of a contract is looked upon as our only recognisable supreme service, into which all others merge as mere incidents of minor moment.

The question before us, therefore, is now this:—On what principles is the architect to discharge his duty as director, supervisor, and adjudicator, under a contract between proprietor and builder? Shall it be on what are called "legal" principles, or on any other principles? What does the proprietor expect? What does the builder expect? What do lawyers themselves expect? I will take these questions in order; but permit me so far to anticipate as to observe at once that what the best lawyers expect is that the architect shall at any rate not play the lawyer. That he should inform himself upon the superficial principles of the law of his business is an obvious duty; but that he should dabble in legal precedents, and quote cases from the reports, is an impertinence. His function is to be expert in good sense, not in jurisprudence.

Setting aside, therefore, for the moment, all that is called law—or, perhaps I ought to say, leaving law to the lawyers, whose business it is—let us look at the building contract in that aspect which we as architects come to understand by a personal instinct, acquired from experience: we call it our professional common sense; and here again my point is that we are entitled to rely upon this instinct with all the greater confidence when we remember that great lawyers are never tired of telling us that law after all is only the essence of common sense, neither less nor more—common sense the principle, law the mere exponent. What, then, viewed in the light of this common sense, do the several parties to a builder's contract truly intend and mean?

The proprietor or employer desires and expects two things: first, to get his work done with all proper economy; secondly, to know beforehand what money he must provide. Both these expectations are quite reasonable, for the architect and the quantity surveyor are paid expressly to realise them. But at the same time we all know that in both cases the principle is liable to abuse. When the proprietor is allowed to overstrain economy, he overstrains the contract; and anything that is overstrained, no matter what it is, must sooner or later snap. When he goes even farther than this, and hopes to secure a contractor who has made an unwary reckoning, and means to hold him to the grindstone of a losing bargain, he is (in my humble judgment), let commercial law say what it may, contemplating something like a fraud; and in such a case, not only ought the sanction of the architect to be refused on the ground of honour, but both architect and client will do well to remember that there exist inflexible natural laws by whose silent operation the offender is not unlikely to find that grindstones grind both ways.

However, I think I may say it is extremely seldom, except in the very lowest classes of work, that the proprietor entertains any less commendable desire than to secure by honest trade-competition the attainment of the most reasonable honest price; and then, as regards the second point, what he expects—because he pays for it—is to be fairly informed at the first what is to be his outlay at the last. I need not remind you how easy this is in theory, and how difficult in practice. You all know how often extras spring up like weeds in the field, in spite of precautions; so that the only way to avoid them hopefully is to recognise them fairly and make allowance for them, not scientifically, of course, but by some rule of thumb, which will answer quite as well; acknowledging in this way the principle that, so far as prudent and experienced advice and warning can accomplish the object, the client is really entitled to feel that the contract which he is advised to sign will cover the actual expense of his project. Nevertheless, the idea is worth noting that the anxious care which we invariably bestow upon the framing of a special clause in the specification or agreement, to provide for deviations being duly accounted for, is obviously the very strongest possible evidence that deviations must be expected; in fact, the rule that extras arise one knows not how is only a translation into other language of one much more easily understood, that improvements in matters of detail must inevitably occur to a mind of any intelligence during the leisurely process of building; in which sense an architect who makes no deviations is a dull man.

What, then, does the builder expect? He certainly does not expect to lose money by his contract; but to gain a profit, if often only a small one. Looking at the *modus operandi* of competition-tendering, is this not plain at any rate:—that the builder puts faith in the architect, and in the quantity-surveyor, to a degree which has, I think I may say, no parallel in any other kind of commercial business? What he expects, therefore, may be expressed in a single short phrase—fair dealing—honest and honourable treatment on the part of the architect, whatever may happen.

I am proud to be able to stand up in this assembly and repeat my proposition that the confidence with which building contractors are obliged to leave their fortunes to the good faith of the architectural professions is seldom abused; exceptions at any rate prove the rule. But I am surely right in suggesting that this fact ought all the more to impress upon our minds the unusual weight of the obligation that rests upon us to be just and fear not, in the highest sense of the words. I should be wasting your time if I were to recall to your remembrance, however cursorily, the daily dependence of the contractor upon the almost arbitrary direction of the architect; the explanation of alleged intentions not clearly expressed in his own documents of contract; the inexorable demands for expedition under acknowledged difficulties; the allowance or refusal of certificates for payment; the judgment of quality of material and workmanship; the recognition or not of deviations; their valuation; and much more; but what I have to submit to you is that the more fully we contemplate the whole of this well-known course of tedious and difficult administration,—frequently almost diplomatic in its tediousness and difficulty, and frequently also a task necessarily entrusted to less experienced hands,—the more clearly must we see that the extraordinary complexity of the transaction lifts it quite above the

common level of commercial contracts, and demands a code of fair dealing very different, not in theory, of course, but certainly in practice, from the every-day work of the shop and the counting-house, and, I say plainly, of the solicitor's office.

Now, what will a lawyer say to all this? He will tell you as plainly as he dares, having regard to the professed omniscience and omnipotence of his order, that to introduce him and his ways into this complicated business without urgent need is not fair dealing. The abstract ideas of his artificial and too ingenious logic he can supply if you wish, but the practical working of them is, and must for ever be, in your hands alone as practical men. Nay, he can devise arguments and quote cases, cheerfully enough, as long as you please, and in whatever direction you please, but he will decline altogether on principle to touch even the elementaries of substantial guidance; just as the geologist will develop to you the history of the rock, or the botanist the structure of the tree, while the responsibility for quarrying and working the stone, or for seasoning and utilising the timber, he will on no account undertake.

Thus it is also, whenever building business of any kind has the misfortune to fall into the terrible trap of English litigation, that the legal agents on both sides demand, not merely the aid, but the responsible direction (as we may venture to call it) of architectural experts, nominally witnesses, really advisers, prompters, and advocates; and I may safely add the reminder that in those cases in which the expediency of such direction is somehow overlooked, and legal disputation, even of the best, alone relied upon, nothing can be more palpable to practical men than the confusion that prevails, and the fallacious nature of the conclusions that are arrived at.

We may say, therefore, that from the beginning of a building transaction to the end of it the architect is in every respect and at every step the essentially necessary director; commencing with the development of the design, artistic and scientific; passing on to the adjustment of the cost, the administration of the contract, the arbitration (strange to say) between his own client and the builder of all the questions of incidental detail, and even of the accounts; and at last concluding, if such a misadventure should occur, with the direction of litigation; or its guidance, if he can, into the more appropriate and safe process of adjudication by reference to a practical expert, for the attainment of a common-sense decision on purely practical instead of legal principles.

I have incidentally alluded to the very peculiar understanding which is established between proprietor and builder, that the architect, although in law the responsible and paid agent of the one party alone, is to arbitrate in all difficulties between the two. How the law reconciles this one-sided arbitratorship to its sense of the unbiassed nature of the judicial function I have never very clearly seen; in fact I think the lawyers give the question the go-by; but the possibility of such an arrangement being even tacitly submitted to by the builder is proof positive again of the very remarkable peculiarity of the transaction, and the equally remarkable confidence which the architect commands. So completely is he bound in superficial law to the undivided service of his employer's interests, that masterful clients, such as a public board or a government bureau, can frighten him almost out of his senses with overbearing exactions; and yet all the while

the builder will trust him implicitly, even when he has made up his mind to face the inevitable in the form of a lawsuit with his unreasonable masters. Nay more, perceiving only too plainly, as he will sometimes do, that the architect is embarrassed, and, we may say biassed, by what we shall call personal difficulties of expense, even still, subject to a little more careful scrutiny, perhaps, of possible severities that may lurk in the specification and agreement, the builder will trust to the traditional impartiality of the profession, as his best security for honest if not liberal treatment in the end. It is for reasons such as these that I deprecate the specious affectation of some architects who, as their phrase goes, "take their instructions from the solicitor;" a thing, which, in many other matters than the administration of contracts, produces incredible confusion and not a little iniquity. When a lawyer of high class calls in an architect, it is to take his advice, and defer to it; he will advise him of course on any point of law, but even this will be with a certain deference; for he feels that the architect whom he has to instruct how to conduct his own business must be an ally of very doubtful value, while he who is ready to be the instrument of artifice is even less estimable still.

The practice of tendering in competition for contracts is in theory a very plausible one, but its true efficiency is obviously inversely as the complexity of the contract. Through the help of the skilful profession of quantity surveyors, the process of estimating, when in their own hands, has no doubt been brought to a condition of considerable perfection; but any one who has seen much of the priced bills of contractors must have been convinced, however minutely systematic the preparatory work of the surveyor may be, that the way in which this is followed up by the competing builder in pricing the items is often far from being equally scientific. Between the two elements of the estimate, therefore, the certitude of the quantities may be to a great extent nullified by the incertitude of the pricing; and I can imagine a student of the philosophy of commerce, when contemplating a collection of building estimates, declaring himself wholly unable to account for the close tendering which sometimes takes place between the higher firms in competing for the higher orders of work, and not so much at a loss to find a reason for the prodigious extremes of diversity which inferior firms, dealing with inferior contracts, so frequently display. I may also remind you of another incident that comes out of this state of things—namely, the difficulty which is not unfrequently felt by the architect in dealing with the priced bills of quantities as the agreed basis of his valuation of extras and omissions; especially when they are sprung upon him from under seal after the work is completed, with not only eccentric prices, but oversights, arithmetical errors, and arbitrary or speculative allowances to mystify him in all directions.

Nevertheless, the acceptance by the employer of the bills of quantities as a basis of the contract is a principle which, as you all know, has recently been urgently advocated, and, indeed, a good deal acted upon. We have to bear in mind again that the elementary purpose of the contract is to relieve the proprietor from the ordinary financial risks of his speculation. But it is pointed out with much earnestness that there are some of our most honourable practitioners whose notions of a contract

go much farther than this; they think it is the duty of the architect and the quantity-surveyor to throw off from the shoulders of their mutual employer, not only the ordinary or visible risks, but the extraordinary or invisible risks also, and, indeed, all risks impossible to be foreseen and appraised; which they do by simply requiring the contractor to take them upon himself at his own price. They lay it down with great readiness as a self-evident axiom that their client is entitled to know exactly what he will have to spend. But how is this a self-evident axiom? Is it not much more reasonable to suggest that all risks which cannot be foreseen ought to remain risks of the proprietor? Why should any risk be foisted off upon the builder which the bills of quantities cannot be made to define with certainty? There are two very different points, however, here involved: on the one hand there is the correction of any accidental errors in the quantities; on the other, the obliteration of all hazardous clauses from the specification and agreement. With regard to the correction of the quantities, I think all that need be observed is that experienced men have very little fear of the work of careful surveyors being found materially incorrect; but upon the other point more must be said. I will not quote the language of the speculative clauses which even the most well-meaning architects are apt to insert in their specifications, in their anxiety to relieve the client from uncertainty; but I venture to affirm that sound lawyers, even the most strictly commercial amongst them, the most uncompromising supporters of the sanctity of a bargain, will be found to advise us against all stipulations of the sort, on the ground of their being in both principle and practice unlawful. There are, I believe, numerous instances in law of the recognition of the idea that a bargain which it is impossible to fulfil it is unequitable to enforce; as in diplomacy a treaty which is found to be unworkable must be revised. It is pretty much the same thing to say, especially in connection with such a complex case as that of a building contract, that the bargain in which one party has the advantage of the other, whether by design or by accident, is very likely to turn out a bad bargain for both alike. Speculative conditions, therefore, whose object is to impose upon the contractor unknown risks, for which it would be idle to suppose that he has provided an adequate allowance, are essentially unsafe conditions. Although in many cases they may fortunately do but little harm, everybody knows that they have sometimes turned out to be ruinous; and what I desire to point out is, that probably there is no instance in which the natural laws of the commercial fitness of things are thus grossly outraged where the re-action has not been, in one form or another, equally severe. A perfect building-contract, therefore, would be one in which the bills of quantities provide for every foreseen hazard with perfect precision, and exclude every unforeseen accident with equal distinctness; and then, granting an appeal either from the specification to the quantities or from the quantities to the facts, with an architect who is as watchful over the prevention of disputes as he is solicitous for the adjustment of them on equitable principles, I see no danger of misadventure thus far. I am, therefore, very much disposed to think that all liberal-minded architects must already be in favour of the abolition of the system under which a builder is induced to tender upon bills of quantities,

generally prepared under the architect's own control, which are repudiated the moment the contract is signed.

Another point of practical administration with regard to which we seem to be in a state of confusion is that of the quality of work. When a man of any experience looks down some of those lists of tenders which are published in the journals, in which, we shall say, leading firms are competing without restriction for a high-class public work, it would be folly to pretend that he does not know the reason why certain names are at the top and certain others at the bottom. For the reason lies, not by any means in legitimate differences of commercial enterprise and administrative economy, but in the fact that where one class of men will never scamp the work, another class will never do anything else. The only thing, however, that concerns us at present in this respect is the responsibility which is thus thrown upon the architect; and here the principle of liberality which I am advocating seems to be most difficult of application. Is the architect to accept the impracticable task of compelling a cheap builder to supply expensive work? On the other hand, is he to sanction the practice of delivering tenders that are not honest in their prices? One way, at least, there is out of the difficulty; and this is the course usually adopted; except, of course, where an employer cannot be induced to recognise the common sense of the matter; the architect selects the competitors, and simply avoids the certainty of a hopeless struggle for good work by avoiding the pretenders to cheapness, just as one must do in matters of ordinary merchandise. But I still think the language of our specifications is negligent. Everything is to be what is called "the best of its kind" to such an extent that the phrase ceases to be discriminative, and becomes a sort of expletive; we might as well say everything is to be "awfully good," or what not. The only remedy for this radical want of definiteness in the contract—for such it must really be called—is that the architect shall know and approve beforehand the customary quality of his contractor's work; while, on the other hand, the rule which is followed by many public boards, laid down frequently by statute, and sanctified by the example of the Government, that all comers shall be allowed to tender who can profess to offer sureties, however well it may answer in simple contracts for supplies, is surely dangerous to all parties concerned in the complex contracts of building, and most dangerous, I may observe, to the architect.

In respect of extra works and deviations the personal honour of the architect is not unfrequently brought prominently into view on comparatively simple ground. Generally speaking, the extras are employer's extras; but it is one very natural consequence of the contract system, and more especially of the practice of competition tendering, that a contractor must be excused for being somewhat exacting about architect's extras. A severe and suspicious system of contracting must inevitably demoralise contractors as a class. You put them under extreme pressure in respect of price, and they would be more than human if they failed to reciprocate the pressure when it comes to their turn, even when it is not the case, as it frequently comes to be, that stern necessity compels them. However, I think we must give not a little credit to some contractors

in this respect, even when we are forced to regard some others in a different light. But the great difficulty with the architect in respect of extras of the client's own making is I think, the disappointment of the client; and the philosophy of this disappointment lies deeper than we generally suppose. It is not, I venture to say, at least in ordinary cases, that he complains so much of not receiving value for the ultimate amount of outlay; for everybody is accustomed in most things to find the expectations of his own wishes at fault in this way; but he wants to know why the expectations of his architect have been at fault. In short, he was allowed to start with the idea that he was to be relieved from all the natural risks of his enterprise, and he finds that he has not been so relieved, although, as he will say, his orders have always been so extremely reasonable. Moreover, he has been allowed to suppose that the contractor had taken all risks upon himself (although he scarcely knows why he had been so very accommodating), and now it turns out that they are repudiated. In the first place, what is an architect for? In the second, what is a contractor for? Again, I think I may say that an architect is too apt to look at extras as a personal matter to himself; and this arises out of the aforesaid anomalous arrangement whereby the paid agent of one of the contracting parties is arbitrator between the two. But, at any rate, perhaps the wisest course for the architect to pursue is to take great care that his client is kept informed of the accumulation of extras, so that he may be fully prepared for the account of them. Young architects, I may be allowed to observe, are too often timid in this respect, and rather inclined to keep the extras a little in the dark—a very bad plan. I need only add that to price extras at a loss to the builder is what no architect ought to consent to do; at the same time, to price them higher than a proper standard is an act of generosity which he must not attempt, as a matter of pecuniary risk as well as honour.

Vague general clauses, whether in specifications or contracts, I must confess that I regard as all unfair. I have several times referred to the radical error in principle which is involved in the idea of relieving a proprietor from the unforeseen risks which are inseparable from his speculation. That he who takes the incidental benefits ought to take the incidental risks is a mere question of simple equations. It seems to me to be idle to reply that the architect has only his client's interest to look to, and that the contracting builder must look to his own. This may be the language of superficial law, but it is not the language of professional honour. If it might even be held to represent a logical, although still severe view of the case, supposing the architect's agency either to cease with the signing of the contract or to begin with the signing of the contract, the fact is that it neither so ceases nor so begins. If the architect is to be impartial as an arbitrator during the whole period of the execution of the contract, why should he not be equally impartial as the negociator of the contract? It has been argued that the contractor forms an appraisement of the general risks, and charges for them by way of an insurance allowance. But we all know better than this; the persons delivering the highest tenders may do so; but, if they do, that is one reason why they are highest; the lowest may rather be considered to have ignored accident altogether, and resolved to fight the point if it should come up. Not only so, but, if the bills of

quantities are to be a truly scientific statement of the facts, it cannot surely be denied that every "general" item, even when copied *verbatim* from the specification, is an unscientific item; and I am not sure that it is not legally an act of professional negligence, involving responsibility to the contractor who suffers. So also, if the architect is one who is so fond of a "tight contract" that he hedges it all about with these vague general clauses, even when they may not be palpably speculative, he is not, I think, entitled to regard this as a merit, but rather the contrary; inasmuch as true merit in that direction would rather be indicated by the circumstance of the drawings and specification in all their particulars, and the quantities if so recognised, being everywhere so clear that no saving clauses were necessary to cover possible oversights. Take a single example: "The building in all its parts is to be delivered complete in every respect, "notwithstanding any imperfection or error that may be discovered in either the plans "or the specification." There is no merit in a condition like this, but only something very like a confession of carelessness. A liberal mind devising liberal things, or even an upright mind delighting in fair dealing, might surely try to dispense with conditions so one-sided as this. No doubt the contract ought to be clear, but this is not clearness.

The "arbitration clause" which of late years has been introduced into our forms of contract is worthy of a few observations. So far as I have heard it is not so frequently acted upon as was expected; which I take to be one more evidence of the general trustworthiness of architects. But, speaking generally, it is not only an act of good faith on the part of any architect to allow this provision to be freely introduced, but a matter of prudence in the direction of the avoidance of possible litigation against his client. The practical working of such a provision is, however, very uncertain; and chiefly on account of the danger of a referee being appointed in haste who is discovered to be not well qualified for dealing with the kind of questions which come by accident to be submitted to him. The nomination at random of a mutual acquaintance who has no special aptitude at all for arbitratorship is, in this as in other cases, a fatal blunder; it is always indeed best to prefer a stranger, and one whose reputation as an all-round man is a guarantee of efficiency. And in truth, when you reflect a little upon the functions of this referee, it is plain that they are not easy of exercise. Having the faith in the profession of architects which I have repeatedly expressed, I am inclined to believe that, in the majority of disputes between a respectable architect and a contractor, the architect is most likely to be in the right. At the same time I can scarcely conceive any circumstances in which a contractor who is evidently losing money instead of making a profit can be undeserving of sympathy on one ground or another; and I am especially entitled to say this, if I am permitted to ask one question:—whether it is not an important point in an architect's duty to his client to take care at the outset that the contract is not to be a losing one for the builder, and consequently an unsafe one for himself, as an inevitable source of dispute sooner or later amongst all concerned.

In this connection I can scarcely help offering a suggestion. If the precaution of an arbitration-covenant between architect and builder is so necessary as it is for the settlement of accounts, might not a similar covenant between architect and client be an

equally valuable rule for our professional charges? No client would object to it at the outset—quite the contrary; and the disagreeable choice which frequently has to be made between an ignominious surrender and a haphazard law suit would surely be well worth attempting to avoid.

The last point of detail with which I desire to deal is the action of the architect as a formal arbitrator when a reference takes the place of litigation; and I am bold enough to affirm that there is practically no possible matter of dispute under a building contract in which the judgment of an architect as referee is not infinitely better in every way than that of a public Court of Justice. Litigation is the process provided by the State for the settlement of those disputes between man and man which are an inevitable accompaniment of all our affairs; and, indeed, in theory the very first duty of a State, or second only to that of protection from violence, is the adjustment of such disputes promptly, efficiently, and as far as possible, inexpensively. But we are warned on every hand in this country to avoid litigation as we would a pestilence; the growing dissatisfaction of the whole commercial public with its palpable inefficiency and outrageous cost is becoming one of the movements of the day; in a word, there is probably not a lawyer of eminence in England but will acknowledge that, as a means to the ostensible end in ordinary business, it is a failure—as I have heard it well described, a toss-up, the loser half ruined and the winner getting change for a sovereign. Even in matters of the simplest contract this is so; and in the complex affairs of building *à fortiori*. It has long been the custom, therefore, in this particular field of ours, where the hazards of litigation are peculiarly serious—because of the entirely artificial character which the contest must acquire in the hands of clever advocates who cannot grasp the facts—to take as a substitute for the public legal tribunals the private Court of an expert arbitrator; and here the very highest qualities of the architect, as a man of business and a man of honour, come into view. It must have been observed by every one that our professional referees have time out of mind been furnished chiefly from the class of measuring surveyors and the kindred class of property valuers. The simple reason for this is that the greater number of references necessarily have to do with questions of disputed valuation, whether of house property or of builder's work. But at the same time I have observed that, whenever a professed architect has been engaged in such business—and there is nothing in either property valuation or the quantities and the valuation of builder's work that an average architect ought not to be unable to deal with—he has always been treated by his colleagues with marked respect, in practical recognition, I suppose, of traditional rather than personal dignity. Although, therefore, I have the greatest respect for the qualifications of the surveyor in matters of value, I am inclined to argue that the practical architect is the preferable referee for contract disputes, whether under the general rule of the arbitration clause or in special cases; and I think the time has come for doing away in a great measure with the standing fallacy that the architect and the surveyor are two, not one—a principle which can only deteriorate both. I do not regard even the possession of high artistic powers as a disqualification; for we have most distinguished artists who are equally eminent administrators, and if such a man is unable to grasp

the figures as well as the facts of a controversy, I think his deficiency must be exceptional. In the course of my life I have seen a good many Courts of law, judges of all kinds, sheriffs, juries, counsel senior and junior, solicitors expert and inexpert, careful and not careful, masters, registrars, and clerks; and I grant there is an aggregate of worldly wisdom here which might be well worth a reasonable proportion of its present cost if that cost could be appropriately applied. I grant also that I have seen arbitrators and arbitrators; but I never saw an arbitrator of anything like ample qualifications in building matters whose decision, even when he split the difference openly and divided the costs, was not far and away more intelligent and acceptable than that of any Court of law.

Allow me to add a few miscellaneous remarks of a more specific character regarding arbitration generally. First I take leave to recommend for many cases, in the place of the customary reference to a single individual, the mode laid down in the Building Act for questions of party walls; I mean the tribunal of the three surveyors; where each side appoints one, and the two agree on a third, the three then constituting a Court of so many equal adjudicators, any two of whom may make the award. To say no more in passing, it seems to me that this system not only does away with the silent and secret workings of the one mind, so frequently the cause of painful distrust during the proceedings, but prevents the suspicion of unauthorized compromise of duty, and the desire for an appeal at the close; while it allows the task of advocacy greater scope and freedom in the right direction, and opens a most convenient door to friendly negociation throughout. I may go on to say that I think the employment of architects instead of lawyers as avowed advocates before a single referee would involve no sacrifice and be of great service to the cause of economy. Again, I would take leave to protest in the most decided way against the specious allegation that our arbitrations are more costly, instead of less, than lawsuits; it is lawyers' arbitrations that are so costly, because the proceedings are necessarily so slow and irrelevant and so full of artifice. It may be readily supposed that I also decline to admit the need for a formal legal assessor in an architect's reference, except in peculiar circumstances; and that I am opposed to the reference of building cases to a barrister, even with an architect as his assessor. I need not go on reminding you that I have perfect faith in the architect; and my leading proposition I do not desire to qualify in the slightest degree—that accomplished architects are *ipso facto* the only safe conductors of building difficulties; a proposition which I believe every day will become more completely self-evident.

I come now to the end of my argument; and, having regard to all the various incidental circumstances in which I have represented the architect as having to deal with building contracts, I have to submit that what I call liberality, loyal justice to all concerned, impartiality that is warm and sympathetic with life as distinguished from impartiality frigid and dead, is the best, strongest, and safest policy for him to pursue; avoiding harshness of every kind, and especially punitive harshness, as the province of the lawyer alone; and impressing upon his every word and act the mark of that generous fair-dealing (as distinguishable again from ungenerous fair-dealing) which underlies not only the traditional dignity of his vocation, but the personal position of almost

unparalleled confidence which he is accustomed to occupy by general consent. That a contractor must fulfil his contract is not the termination of the argument, but an axiom at the beginning of it; *summum jus* may be *summa injuria;* the law is made for man, not man for the law; the elasticity of English law in particular, with all its faults, is its boast, and the ultimate appeal to the public good-sense its open safeguard; it professes to leave no wrong without a remedy, and no superficial rigour without means of alleviation. It is this spirit that I am advocating as the law of architects; and I believe it is that which is recognised by all the best of us in private business. But I go farther and say that this view of the case will be supported by lawyers. In other words I must venture to suggest, as even a principle of law, that, in dealing with such complex and altogether specialistic matters as the affairs of building, the expert or specialist, as distinguished from the generalistic lawyer, shall not permit his mind to be confused, and his judgment warped, by legal formulas and dogmas which it is the prerogative of lawyers alone to handle, but, on the contrary, shall confine himself to those more simple principles which he understands, and apply them in his own way, that is, the accustomed way of his craft. In this sense, the architect not only is not a lawyer, but is almost above the law, leaving the law to look to itself; if the law is the embodiment of good sense, his professional judgment is the spirit of good sense without the restraints of embodiment. In this doctrine there may appear to be material for many differences of honest opinion amongst us, but I am sure, whatever controversy there may be, it can only be upon ambiguous words, not upon patent principles of uprightness.

ROBERT KERR.

XXXIII.

THE ROYAL HOLLOWAY COLLEGE.

By W. H. Crossland, *Fellow*, Architect of the Building.

BEFORE I enter on the description of the College, I should like to be permitted to give a slight sketch of another building, namely, the Holloway Sanatorium at Virginia Water, and more particularly to explain how it fell to my lot to have to carry it out.

The late Mr. Holloway had at that time, some sixteen years ago, sought the advice of Mr. George Godwin, the late Professor Donaldson, and the late Thomas Henry Wyatt, as to the best method of obtaining plans. These experts advised a limited competition, and did me the honour to place my name on the list. But after an interview which I had with Mr. Holloway at his place of business, I did not feel inclined to go single-handed into this competition, and I sought the assistance of the late John Philpott Jones, of Whitehall Place, in whose hands I practically left the working-out of the design.

When the adjudication was given in our favour I was up in the woods of Nova Scotia, thinking a good deal more of salmon and moose than of Sanatoria. One day, however, I was recalled to my duties by a telegram from Mr. Jones, to say that we were the winners of the competition, and that I had better come home, which I did very reluctantly. On my return matters had progressed rapidly, and I found Mr. Jones in almost daily communication with Mr. Holloway, submitting to him plans and views of designs in great variety. One of the judges in the competition (Dr. Yellowless) was being consulted on the arrangement of the plan, and Mr. Jones visited him at Bridgend Asylum, where plans were made which were considered perfect. These plans had the entire approval of the Commissioners, and their architects Donaldson and Wyatt. The elevations followed, and showed a building, the characteristics of which were façades of plain and ornamental brick throughout. The first brick was laid by the late Mrs. Holloway under favourable auspices. Shortly afterwards Mr. Jones died suddenly, and the carrying on of the work was intrusted to myself, Mr. Salomons being at Manchester. Then commenced a curious episode, and to me a new experience. Mr. Holloway, who possessed amongst his other many good traits, one of looking into everything which

was going on, and especially into those things which had the appearance of being hidden away, found some dozen men occupied in cutting bricks of an ornamental character, at a cost, as he put it, of twopence or threepence each brick. I happened to be on the ground at the time, and was soon cross-questioned as to whether some other material could not take the place of these ornamental bricks. I suggested Portland stone, which was eagerly adopted, and this change of material necessitated a change in the character of the design. Although the working and detail drawings were all made, they had to be set aside, and, as Mr. Holloway would not allow the works either to stop or slow off, I had to make detail drawings of windows, doorways, &c., hap-hazard, and trust to the general effect turning out satisfactorily.

Two views in my possession show the different designs—one as contemplated by Mr. Jones, the other as actually carried out.

When the time came for opening the Sanatorium, and a doctor was appointed, new Acts of Parliament were in force for the protection of lunatics, especially against fire; and one clause provided that "all rooms occupied by lunatics should open into a corridor, "from which a staircase should lead directly to the outside." Now Dr. Yellowless and Mr. Jones had planned a building on altogether different principles; and when the Commissioners were asked to pass the building, they, acting under new rules, refused. The whole internal arrangements had consequently to be changed, and they are now practically the same as originally designed by Mr. Jones and myself.

I now come to the subject of my Paper, viz. The Royal Holloway College. When the Sanatorium buildings, so far as the working details were concerned, had been practically finished, it transpired that Mr. Holloway had, notwithstanding his almost daily attendance at the Sanatorium, taken steps towards starting his scheme for building a college for the higher education of women. As in the former case, he had consulted with the late T. H. Wyatt as to the best style of architecture to be adopted. Mr. Wyatt, as all who had the pleasure of his acquaintance will easily understand, strongly recommended the style in which he had proved himself so able a master, viz. the French Renaissance, and submitted books, photographs, and engravings of some of the most notable examples of the style, especially Chambord, to Mr. Holloway at his place of business.

About this time Mr. Holloway mentioned casually that he had some idea of starting another great work, and asked me whether I thought a style of architecture similar to the Sanatorium would recommend itself for the purpose. Now it appeared to me that a return either to the purer classical styles, or to the Renaissance of the 16th century was certainly impending. When, therefore, Mr. Holloway invited me to submit to him illustrations of such ancient buildings as I thought suitable in style and character for the proposed College, I selected views of châteaux in the valley of the Loire, as well as that of Fontainebleau; and these I submitted, placing Chambord first. The effect on Mr. Holloway was somewhat startling. After some complimentary remarks as to my judgment, he told me that he was advised to put the design to competition, but would like to hear from me the course I should take in the event

of my becoming a competitor. I replied that I should visit the Touraine, and, with an assistant, sketch and measure Chambord in the completest way; also such portions of the other châteaux as appeared to me useful in the study of the style and containing characteristics not found at Chambord. He then said, "Will you "do this, Mr. Crossland?" To which I answered most assuredly I would. He then patted me on the shoulder, and said, "My boy, you shall have the work; but mind, on "the condition that you sketch and measure Chambord from bottom to top. No more "competitions for me. I had too much trouble about the last;" and, he added, "When "will you start?" My reply was that as soon as I could set matters quite straight at the Sanatorium I would start. In this way came to me the most important work of my life; and I shortly afterwards left with my principal assistant, Mr. Taylor, for the scene of action, Mr. Holloway having stated his intention to join us at Chambord on hearing from us that our work was completed.

But that work was of much too pleasant a character to be hurried, and some six weeks elapsed before I reported it finished. Shortly afterwards we met Mr. Holloway, then over eighty years of age, at Blois, he having travelled through Paris direct. Next day we made a survey of the Château, and here it was decided that our building should be similar to the fifteenth-century work, viz., red brick with stone dressings. After Blois, Chambord had struck me as huge in its proportions and savage in its character; but, on better acquaintance, I found that, although intended for a hunting box only, the Italian designers and workmen had spent all their skill on certain main features, such as the noble double staircase, the magnificent vaulted rooms on the top storey, and those chimneys which Fergusson writes of as being "more ornamented and more ornamental "than in any building erected either before or since." Indeed, the large and highly ornamented dormer windows in the central block are perhaps the finest to be found in any other building of this or any date.

It may safely be stated that from the leads—which were the promenade for the King and his Court—upwards to the fleur-de-lis which crowns the central tower, this Château of Chambord stands alone, in my opinion, in the elegance of its design and the beauty of its sculpture. The massive walls which support this forest of tracery are subdivided by slightly projecting pilasters into square panels, pierced by mullioned windows, beautifully characteristic of the style.

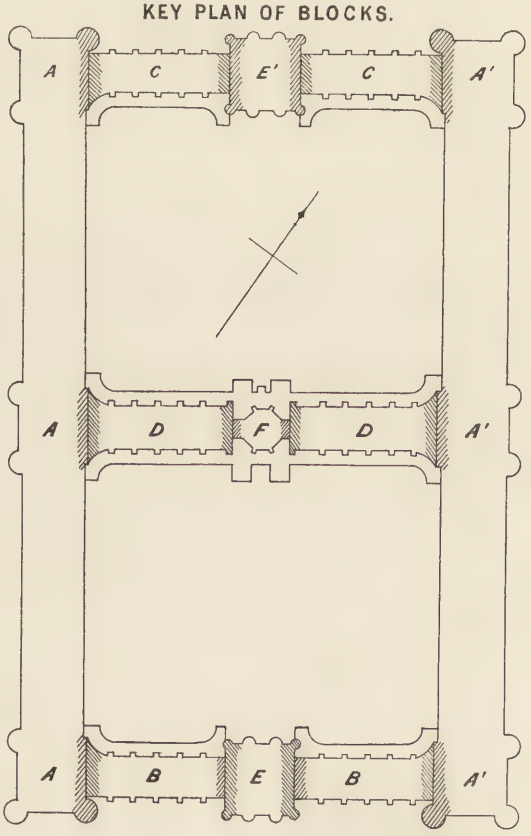
Mr. Holloway, having spent two days in going round and through the building checking off our sketch-books, feature by feature, and finding only one bit of work missing, viz., a small dormer window on the east front which we could not get at easily —*but which had to be got at* before our work could be passed—we started on a tour of inspection to Cheverny, Blois again, Amboise, Chaumont, Chenonceaux, Valençay, Versailles, Fontainebleau, and, having made large purchases of photographs and books in Paris, we made for home.

Some considerable time elapsed before Mr. Holloway took any further steps in the College business, and in the meantime he came under the influence of certain highly-educated ladies, who had been interesting themselves in the scheme, and who persuaded

him that the proper style of architecture to adopt was not the Renaissance, but "the "style in which most of the colleges at Oxford and Cambridge had been built." This new departure led to my making a sojourn at Cambridge of some four weeks, with my client, and with three assistants to help upon a design embodying as nearly as possible all the characteristics of the larger colleges. This design was thoroughly worked-out. But Mr. Holloway and another of our party were attacked by a low form of fever, and another interval of inaction occurred, during which the influence of the learned ladies had lost its effect. At my earnest solicitation, Mr. Holloway returned to the Renaissance, and henceforward there were no more hindrances put in my way. After spending something like two years in working-out the plans, elevations, and details, and revisiting France and Belgium, the question of quantities, and how they were to be taken, had to be considered. It was decided to advertise for a surveyor who would work under me; a set of offices near those I occupied in the Sanatorium were prepared for him, and Mr. Charles Batstone was appointed, on the understanding that he would take out the quantities after a plan which had been agreed upon between Mr. Holloway and myself.

This plan, differing materially from the usual method of surveyors, and having been found to work well, I should like to explain in detail. In the first place, I was anxious beyond all things to have the quantities made intelligible to myself, so that, in the case of any dispute on the questions of certificate, extras, or deductions, it might be determined without the aid of the surveyor. By dividing the building into a number of blocks, lettered A to F [see diagram], and again dividing these blocks into a series of sections bounded by each floor, it became easy, so long as the building was carried on level throughout (and this was stipulated in the contract), to ascertain from the priced quantities what amount was due to the contractor; also, in case of disputed quantities, everything being localised, the reference and proof were easily established. The outcome was that upon the original contracts, and upon other contracts priced from the same bills, there have been no extras. The quantities formed the basis of the contract, and Mr. Holloway made himself responsible for their accuracy.

KEY PLAN OF BLOCKS.



Mr. Thompson of Peterborough was intrusted with the work, and now that his

work is closing in I have great pleasure and satisfaction in placing on record that, from the commencement of the works up to this present, I have never had a serious complaint to make against him; nor has an order of mine been disputed. When I state further that there is not a settlement to be found in the whole building, I need surely say no more to establish the honesty of purpose which has guided Mr. Thompson and his representative, Mr. George Grey, in the execution of the works. A clerk of works was appointed by Mr. Holloway, and his business was to send weekly reports to him. Now, inasmuch as I had stipulated that the clerk of works should confine his duties to the inspection of the works generally,—that he should neither be called upon to set out work, nor to make either drawings or tracings, nor undertake correspondence of any description,—it will be readily understood that his time was spent on the works. For five years he never missed a day, and he dispensed altogether with the luxury of an office. When the works were fairly started (and no time was lost in getting a framed scaffolding enclosing the entire building and six steam derricks on to their platforms), I had a bungalow built and went into residence on the spot. My life for the next four years and a half was one of interrupted interest and pleasure. The Mount Lee Estate was placed at my disposal, and I had Windsor Forest for exercise ground. The setting-out shed and the sculptors' studio were my delight; and altogether I found myself leading a life we architects read about but few experience.

Now I will briefly describe the plan of the College [Illustn. xxxv]. The scholastic department is contained in the two main blocks, and these are connected by rooms, cloisters, and balconies. The refectory and kitchen, arranged on the usual college plan, are divided by the central hall or vestibule. The museum and library, also the recreation hall, communicate directly with the two main blocks. These rooms, and the refectory, are 100 ft. by 30 ft., and 30 ft. high. The chapel is 125 ft. by 30 ft., and 30 ft. high. Each student will have two rooms—study and bedroom, each 12 ft. by 10 ft., and 10 ft. 6 in. high—and a common room is provided for every six students, where they can hold tea and toast parties, or other entertainments. Under the S.W. pavilion there is a lecture theatre, 45 ft. square and 20 ft. high. The building is planned to accommodate 250 students, but on so liberal a scale that 50 may be added to this number, and, including servants, 400 may be set down as the actual accommodation.

Some twelve months after the works were commenced I had to look after and appoint a sculptor, and I was fortunate enough to secure the services of the late Mr. Fucigna, who had been engaged with the late Birnie Philip on the half of the podium of the Prince Consort's Memorial, under my old master Sir Gilbert Scott. He proved himself, in every respect, to be the man of all others the best suited to my requirements. Clever, unambitious, devoted to his art, willing to live, like myself, on the works, and to give the whole of his time to them. He was a member of the Academy of Ferrara, and had studied Renaissance art in Florence and Rome. No comment of mine is needed to show the stamp of his ability, and when I add that his modesty was equal to his talent, it will be understood that I had secured an able coadjutor. He died very shortly before his work was completed, and I venture to affirm, that our profession lost in him a man

who did not think architectural sculpture too poor a ground for the exercise of his ability. These remarks call to my mind another man, also dead, of greater genius, but possessed with the same ideas. I allude to Alfred Stevens, who unfortunately lived at a time when Gothic architecture was attaining its strongest influence under Pugin, Barry, Scott, and Street, and, although backed by the influence of Cockerell, he had, after spending ten years in Italy, studying and mastering the Renaissance, to take, on his return to this country, an appointment at Somerset House as teacher. Thence he went to Mr. Hoole, at Sheffield, to design and model fire-grates, stoves, fenders, &c., for exhibition at the great fair of 1851. Probably most of the members know something of this man's life and work. The latter should be studied by every architect, especially his Wellington monument in St. Paul's Cathedral, which, in my opinion, ranks only second to the "Night and Morning" of Michael Angelo.

If I may, I will give another example of how a great sculptor may be utterly lost to the world for want of employment. Although the incident happened nineteen years ago it is one that cannot be too often quoted, and only recently the Paris newspaper *Le Temps*, in its issue of the 15th December last, printed an account of it, which was copied by a London evening newspaper. Briant, the sculptor in question, received the Médaille d' Honneur at the "Salon" of 1868, after his death, for a bronze Mercury drawing a thorn out of his heel. "The right arm of the god is wanting, and you may "imagine, not alone from the nobleness of the work, but from this defect, that you "are looking upon an old Greek statue. This Mercury was the last work of the "luckless sculptor Briant. Although he had gained the Prix de Rome, and his "genius was acknowledged as incomparable among his French contemporaries, he was "almost always, so far as commissions went, unemployed. A garret served him as "studio, living room, and bed-room. Here, during the severe winter, he worked at his "Mercury, always saving his small quantity of coal for the hours during which his "model was sitting to him. He spent the rest of the day without a fire; one night the "cold was so bitter that he heaped upon his bed all the clothes he possessed. He "suddenly remembered his masterpiece, which he had just finished, and dreading lest "the damp clay should be frozen, he stripped himself and put all his clothing and bed "covering around the figure." The next day, the sculptor was found lying on his bed frozen to death. His Mercury also, in spite of the artist's sacrifice for his art, was frozen, and the right arm had fallen on the floor; so the work was cast in bronze without the right arm, and it is now exhibited for the study and inspiration of young French sculptors.

These are brief and incomplete sketches of two men of marked genius, whose assistance might have been secured by prosperous men in our profession, and to our incalculable personal advantage, to say nothing of the advantages likely to accrue to the nation and the world.

Of Stevens's life and work I knew a good deal, and this knowledge guided me in the course I took with regard to Fucigna, whose work at the College I will now describe. First, as to the filling-in of the four pediments which form centres in the two

quadrangles over the principal staircases. These are:—Commerce and Medicine, to illustrate the characteristics of the illustrious founder; Poetry and Science; Charity and Education; and a large portrait bust of the founder, supported by allegorical figures of "Surrey" and "Agriculture."

Next come a series of heads, forming keystones to the chapel and recreation hall windows, and of the arches in the main entrance gateway. The last are on the outside Minerva, on the inside Hope. On each side are the three prophets—Moses, Ezekiel, and Elijah, opposite the three kings—Joshua, Saul, and Solomon. On the gateway towards the quadrangle are Faith on the inside and Homer on the outside. The keystones to the chapel windows are on the outside Christ, St. John, St. Peter and St. Paul. On the inner or quadrangle side are Pope Julius II., Mohammed (the College is undenominational), Confucius, and Savonarola. Flanking these are allegorical heads of the Elements —Fire, Earth, Air, and Water. About and around the building are various heraldic subjects, and smaller panels in the heads of the windows.

Next in importance to the pediments in the quadrangles are the subjects on the chapel ceiling, modelled in very bold relief, after the manner of the work of Primaticcio at Fontainebleau. These comprise on the south side Samuel and the four major Prophets, with attendant figures, and on the north side St. John the Baptist and the four Evangelists with their emblems. No views of the chapel can do justice to this work, and although some of the charcoal cartoons I possess give a good idea, yet in the modelling of their full size, some important details were added, the value of which can only be seen in the actual work. In the half-domed apse the creation of Eve is treated in a similar manner.

Here I should like to pay my tribute to the memory of one who worked with me some four years with a devotedness seldom found. "He," as Armstrong says of Stevens, "was without social influence or connection, and his nature was as far removed from the "self-assertive as it well could be." He died a painful death, leaving one portion of his work to be completed by his assistant, Boldini, viz., the south side of the apse ceiling.

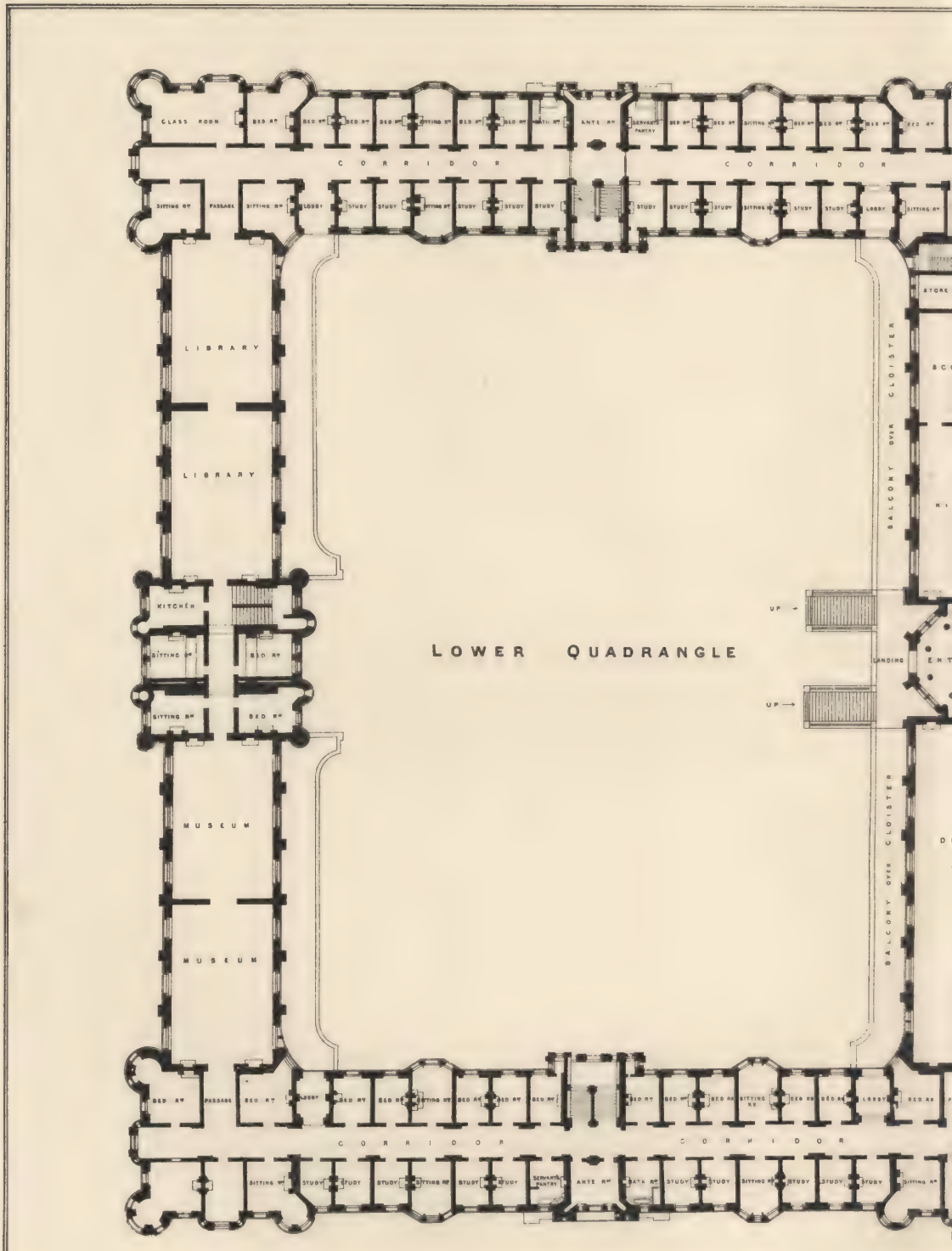
The chapel has been decorated in oil colour and gold—the warm ivory-tinted freestone used in the construction forming the basis. The strongest stroke of colour is applied to the lower division of the walls, forming a very rich and elaborate dado from the floor to the window-sills. The flat wall spaces above this are of a soft green, broken by deep red in the niches between the windows. The waggon vault of the ceiling is treated with gold as a ground-work, but this is divided into panels by longitudinal and transverse belts, corresponding with the architectural divisions below, and in the panel spaces thus formed are circular medallions containing figures of the six Archangels—the Saints Chamael, Gabriel, Michael, Raphael, Uriel, and Zadkiel, with their distinctive attributes. These, like the subject on the semi-dome of the apse, are on blue grounds. The groups of figures on the ceiling and in the apse are delicate in colour, somewhat in the manner of old ivories—that is, the colour is worked into the hollows of draperies, &c., and rubbed off the more salient surfaces, thus avoiding heaviness. The general scale of colour obtained by these means is not unlike that of the Sixtine Chapel. In the apse, and in a line with the side niches, are three recessed arches, in which

are placed standing figures of Our Lord, Saint Mary, and Saint Cecilia. Right and left of the organ, at the west end, are two medallions, each containing two angels singing and playing on musical instruments. The only other part of the building which has been decorated with colour is the central vestibule between the dining hall and kitchen. In the dome of this are medallions containing amorini, with emblems of arts and sciences, on a graduated blue ground.

The late Mr. Holloway was a client who sent me to school, a man who "always "worked with his head, never with his heart," to use his own words. He never spared himself, indeed "he worked harder to spend his money than he ever did to "make it," to again use his own words. He braved at the age of eighty-two, to my knowledge, serious attacks of illness away from home—once especially at Cambridge—which would have carried off any other philanthropist. As he never spared himself so he never spared me nor my clerks. He never, or perhaps very seldom, praised any one. There was, however, one exception. When, on his third visit to the College after its completion, he once again, after six years, patted me on the back and said, "*well done*, "Mr. Crossland, I am more than pleased." To make this clear I must tell you that from the commencement to the finish he was on the works only four times. Almost daily, however, he was accustomed to drive past and view the progress from a distance. His brother-in-law, now Mr. Martin Holloway, used to act as his deputy, and would visit the works to report upon any matters of detail which were raised in the weekly reports sent to him.

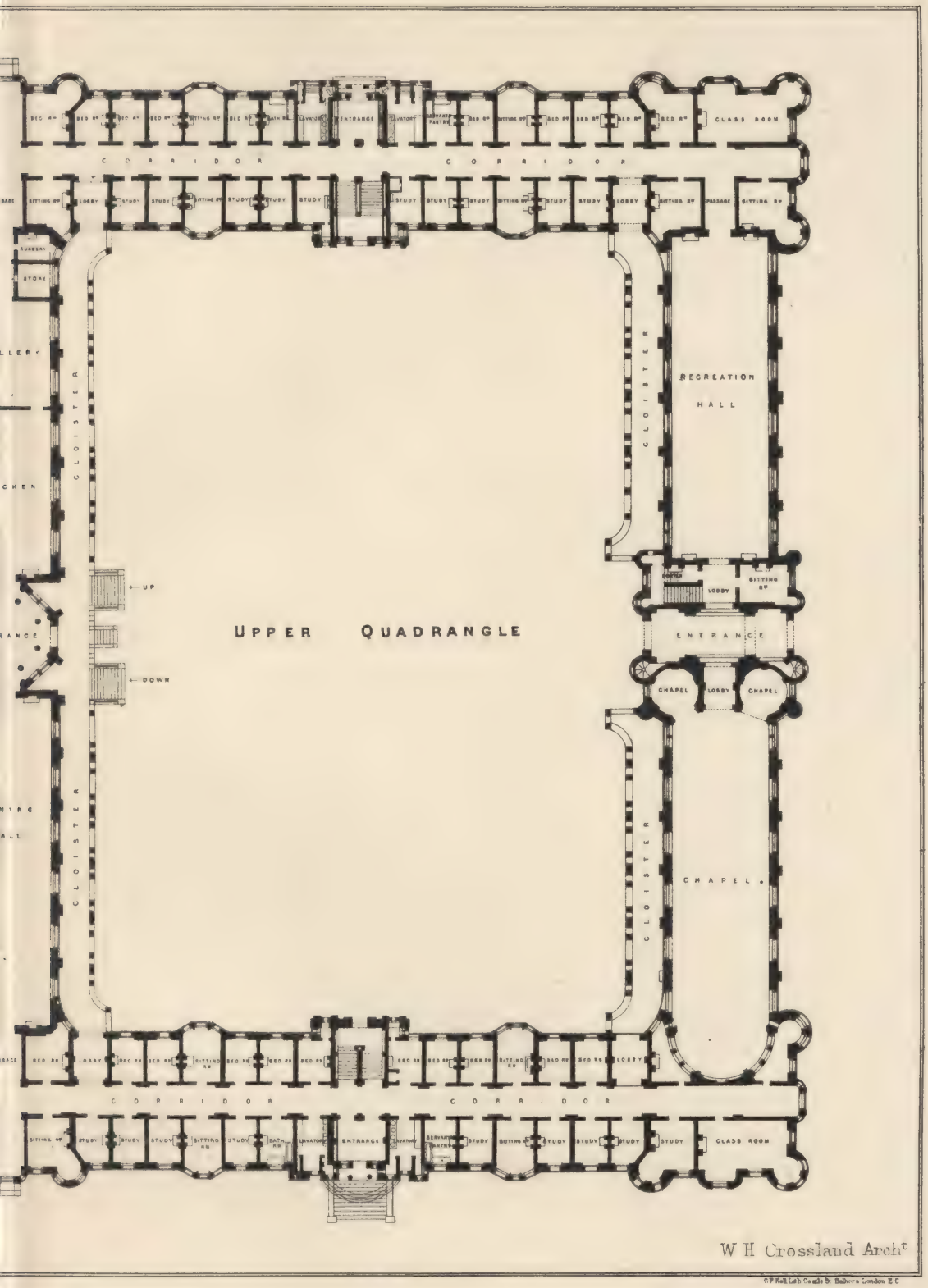
A word in conclusion. The subject which I have most at heart, is the unity which should, I think, exist between architect and sculptor in all works of importance. It appears to me that, if architects who are intrusted with large public buildings were to associate themselves with some sculptor of equal ability, we should not only get more interesting buildings, but we should be spared the shame and dishonour of seeing such men as Alfred Stevens and Briant taken away without leaving more examples of their great genius for the benefit of succeeding ages.

W. H. CROSSLAND.



Scale 50 Feet to 1 Inch.

OLLOWAY COLLEGE, (XXXV.)



W H Crossland Archt

C.P. Kell Lith. Castle St. Holborn. London. E.C.

R PLAN. (Page 145.)

XXXIII. THE ROYAL HOLLOWAY COLLEGE (xxxvi.)



From a Photograph.

The Phototype Company, 303, Strand, London

TOWER BETWEEN THE MUSEUM AND THE LIBRARY, SEEN FROM THE EAST.

XXXIII. THE ROYAL HO



From a Photograph.

THE LOWER QUADRANGL

OWAY COLLEGE (xxxvii.)



The Phototype Company, 303, Strand, London.

SEEN FROM THE WEST.

XXXIV.

THE DRAINAGE OF THE PALACE AND CITY OF WESTMINSTER.

By Mr. John Phillips, C.E.

THE important subject of Town Drainage, little understood fifty years ago, is even now not so well practised as it should be. Our object in draining a house, a mansion, a village, or a town, should be to make the drains and sewers so that the sewage in them shall never stagnate at any part, but be constantly flowing with a self-cleansing velocity ; and the air in them shall also never stagnate at any part, but be always flowing, by fresh air passing down into their lowest parts, and foul air discharging from their highest, into the stratum of the atmosphere above that in which we breathe.

Town Drainage consists, first of surface and subsoil water due from rainfall and springs ; and secondly of soiled and used water, containing organic matters, called sewage, due from houses, public buildings, factories, and other places. The first is comparatively clean water, except that which runs off badly scavenged streets, and where the vehicular traffic is great. The second is a highly foul water which, if allowed to accumulate in the drains and sewers, emits noxious gases into the houses and streets. Towards the end of the last century, and during the first quarter of the present, the water supply to houses in London became general. Owing to this much more water was used than hitherto, and numbers of waterclosets began to be fixed in houses, notably Bramah's valve-closet, which was invented in 1778. Thus a largely increased quantity of soiled water was produced, and discharged into the old cesspools sunk in the ground in the back yards ; and as this water could not soak away fast enough, overflow drains were laid from the cesspools into the nearest ditches, water-courses, and sewers, open and covered, which received the surface water and conveyed it into the natural streams and rivers. In this way the combination of comparatively clean, and of highly foul, water in the same channels was established in London and its suburbs.

If the chemical composition of rainfall or surface drainage, and of sewage, be considered separately and in combination, it will be found, from a sanitary point of view, that combining both kinds of drainage in the same channels was one of the greatest mistakes ever made, as it has everywhere more or less polluted the natural streams and

rivers, as well as the ground we live on, the water we drink, and the air we breathe. What was at first a makeshift, or temporary expedient, was continued and became a system, which has been extolled as the best course to pursue. The evils, however, arising from this combination are always taxing our patience, our ingenuity, and our pockets. Whatever we do, trying to combat the evils is only a palliative, as they are continually asserting themselves, and becoming masters of the situation.

It is now generally understood that the only effectual remedy for the evils arising from the combined system is to keep the two kinds of drainage as much as possible separate, by the provision of one set of drains for receiving surface and subsoil water, and discharging it into the natural streams and rivers; and of a second set for receiving the sewage, and conveying it, as fast as it is produced, in self-cleansing drains to suitable and prepared land for utilisation and purification. This method of draining is called the separate system. It was first recommended by myself, as Chief Surveyor of the Metropolitan Sewers, thirty-eight years ago, in my "Preliminary Report on the Drainage "of the Metropolis." I still strongly advocate that system, and hope all who have anything to do with sewerage will promote its adoption.

The methods by which art and nature would conjointly work to utilise and purify the sewage by this system may be described thus: the sewage would be conducted to reservoirs, and the suspended organic matters, called sludge, precipitated by lime and sulphates of alumina and iron. The sludge would be used by farmers, and dug or ploughed into the land the same as farmyard manure. The liquid sewage would flow by irrigation upon, and find its way by filtration through, the land to the natural water-courses as a purified effluent, leaving the fertilising constituents stored in the soil, whence they would be assimilated into suitable crops.

For the rain-water system the house drains and street sewers would consist of glazed stoneware or fireclay pipes, of 2 to 4 feet lengths, with improved joints. The pipes would be imbedded in concrete, with proper fall, at sufficient depths to drain the subsoil and the lowest open areas of the houses. The diameters of the pipes would vary from 3 to 5 inches for the houses, and from 8 to 24 inches or more for the streets. At suitable places in the streets manholes and air shafts would be carried from the pipes to the surface, with proper cast-iron covers and gratings for examining and ventilating them. Under all inlets for receiving the rain falling on the houses and streets glazed stoneware or fireclay gully pans would be placed for intercepting and removing the débris washed down them. As only comparatively clean water would enter these pipes (for under improved municipal supervision the streets would be cleaner than they are now), they would discharge directly into the natural streams without polluting them, and no noxious gases would generate in the pipes.

For the sewage system the house and main drains would consist of glazed cast-iron pipes of 6 to 9 feet lengths, with inspection covers, curved junctions, and perfectly water-tight joints. The drains in and around the houses would be laid with proper fall on concrete directly under the basement flooring and paving, so as to be always accessible for examination and repairs without opening the ground to get at them. The diameters

of these pipes would be 5 inches for the drains, 4 inches for the water-closets, and 1 to 2 inches for the urinals, lavatories, sinks, and baths. The outlets from all the appliances, such as closets, sinks, &c., would discharge into inspection syphon-traps, through which foul air would not escape into the houses. The water-closets would be of the valve, side-plug, and wash-out types, with flushing rims, and $1\frac{1}{4}$-inch water supply pipes. Accessible syphon-traps would be placed on the drains in the front areas to prevent foul air in the main sewage drains under the streets from passing up them. From the open air 4-inch pipes would be carried down into the inlet side of these syphon-traps for fresh air to pass up the drains. The waste pipes from cisterns, and the overflow pipes from closet and bath safes, would discharge into the open air. The pipes from sinks, lavatories, urinals, and baths, would discharge directly under hinged open-air gratings, fixed over syphon-traps put at the head of pipes leading to the main drains. Thorough ventilation of the drains would be effected by carrying the soil pipes, or special 4-inch pipes, from the upper end of the drains at the back of the houses, above the roofs, and discharging well away from windows and chimneys. Thus fresh air would be always flowing down into the drains, and carrying the gaseous emanations therein up the soil or special pipes into the atmosphere above the house tops. It may be confidently stated that if the rain water and sewage drains in houses be properly designed and executed, in accordance with these principles, houses would be everywhere efficiently drained.

The main sewage drains would be laid under the streets, and continued thence to the sewage farm, or into the sea. Sewage in towns is an absolutely measurable quantity, according to the number and pursuits of the inhabitants. The quantity, however, varies during the twenty-four hours, being least in the night and most in the middle of the day. Hence knowing the quantity of sewage, the sizes and falls of the drains for removing it may be easily calculated. These should be regulated so that the flow shall have a velocity of not less than $2\frac{1}{2}$ feet per second. If the flow has not this velocity to keep the organic matters in suspension, these will certainly deposit along the drains and there decompose. I deduced and proposed this self-cleansing velocity from observations and experiments I made in the Westminster sewers in 1845, forty-two years ago. The application of this principle in regulating the falls of sewage drains is the key to perfect sanitary drainage. As these drains, even when self-cleansing, would not be altogether free from noxious vapour, this would be completely carried away into the atmosphere above the houses by means of a system of fresh air downcast and foul air upcast pipes. These drains would also have inspection shafts, with strong air-inlet and moveable covers thereon at all the main junctions, as well as at convenient intermediate points. The bottom of the inspection shafts would be provided with syphon-traps, having moveable air-tight covers over their outlet parts, so as to divide the drains into separate ventilating sections, and thus prevent foul air engendered in any one section from passing into and up adjoining sections—the foul air being conveyed away, from the head of each section, above the house tops, and not discharging into the streets as it does now.

Where towns or districts are hilly, or on sloping ground, the necessary falls are easily obtained to make the drains self-cleansing, and to convey the sewage by gravita-

tion to distant land for utilisation there, or into the sea. But there are many towns and districts, especially on the margins of rivers, estuaries, and the sea, where the ground is low and flat, and where it is impossible to give the drains the necessary falls to be self-cleansing without going down to excessive depths. Such districts, for instance, are Fulham, Chelsea, Pimlico, Westminster, and Poplar, on the north side of the Thames; and Battersea, Lambeth, Southwark, Bermondsey, and Deptford, on the south side. In such districts, however, the difficulty may easily be overcome by dividing the drains into sections converging to receiving stations where the sewage would be lifted to sufficient altitudes to ensure its flowing by gravitation to distant agricultural land, or down to the sea, to be discharged therein from the level of the highest tides under low water level. This mode of dealing with the sewage is now in active operation at the Palace of Westminster, at Eastbourne, at Southampton, and at other places, where Shone's Hydro-Pneumatic System is employed in ejecting the sewage, with economical and completely successful results. I may here observe that this system is eminently adapted for giving the necessary falls to the main sewage drains converging to receiving stations, so that they shall be self-cleansing without going down to excessive depths; and also for ejecting the sewage from the receiving stations to sufficient altitudes, so that it shall be constantly flowing by gravitation from the initial inlets in the houses to the stations, and thence to the final outlets. So much for the separate system. I will now proceed with my description of the drainage of the Palace and City of Westminster.

The Palace of Westminster stands, as all know, by the Thames. Its entire area, including Westminster Hall and Old Palace Yard, is about fourteen acres. Its roofed, flagged, and paved surfaces, off which rain runs into the Palace drains, are about ten and a half acres. The whole Palace might have been well and efficiently drained in the first instance if the simple expedient had been followed of keeping the rainwater drains separate from the sewage drains. The surface water might have been collected into drains falling from west to east, and discharging by one drain from near Trinity high water level down into the river, behind the terrace-wall, to low water level; and the sewage might also have been easily collected into one main drain running from south to north, with a fall of 1 in 150, and constantly discharging into a ventilated syphon-trap overflowing into a sewer in Bridge Street at the south-west corner of old Westminster Bridge. A fresh air pipe might also have been carried down into its lower end, and a foul air pipe from its upper end to the top of the Victoria Tower, for thoroughly ventilating it. If the Palace had been drained thus, noxious gases would not have generated in either set of drains and escaped into the building. The manner in which the Palace was actually drained was totally different, and it may be described as follows:—In 1838-9, a main brick sewer, running from north to south along the centre of the Palace was laid down, into a main sewer then existing in Abingdon Street, the outlet being near the sout-west corner of the Victoria Tower, and the head on the north side of Speaker's Court. The length of the sewer was about 1000 feet; its size was 5 feet 6 inches high, by 3 feet wide; its shape was a segment bottom 6 inches deep, with

upright sides, and semi-circular crown; and its fall was 1 in 923, or 1 inch in 77 feet. Into this sewer was conveyed, by numerous 9 and 12-inch, and 2 feet by 1 foot, brick drains, rendered inside with cement, all the sewage produced in, and the rain falling on, the Palace. This sewer, owing to its excessive size, bad shape, little fall, and absence of any means of flushing it, accumulated sewage deposit to depths varying from 6 to 18 inches; and from the decomposing sewage noxious gases continually escaped up the drains into the Palace. The sewer was occasionally cleansed, and additional traps were provided to keep down the smell, but all to no purpose.

At last, in October 1846, the smells were everywhere so bad, the architect of the building consulted me as to improving the main sewer. I was then Chief Surveyor to the Westminster Commission of Sewers. I found from examinations that the liquid sewage and rain water, from being spread over a wide flat uneven area, had no power to remove the organic matters discharged into it,—that, in fact, the sewer was little better than an extended cesspool. I also found, by levelling—there was no Ordnance Survey at that time—that the sewer in Bridge Street, already mentioned, was 5 feet lower than the sewer in Abingdon Street. I subsequently recommended the architect to take out the invert of the Palace sewer, to put in a narrow, deeply curved invert, with a reversed fall of 1 in 215, in place of it, and to continue the sewer northward across the Speaker's Green into the sewer in Bridge Street. This recommendation the architect adopted and carried out; at the same time, owing to the increased depth obtained, he was enabled to drain the Palace along its east and west sides at much lower levels than those parts had hitherto been drained. In the end, the sewer, as altered, and the main drains connected therewith, became self-cleansing. They continued in this improved condition for a quarter of a century, until about fourteen years ago, when the Metropolitan main low level sewer was put down through Westminster and Pimlico under the direction of the Engineer to the Metropolitan Board of Works. Since then, the discharging level of the sewage from the Palace sewer, as well as from the sewers generally in Westminster and Pimlico, instead of being lowered and the flow accelerated, has been materially raised and the flow retarded, and the sewers themselves have been thus converted into sewage and rainfall reservoirs. How this state of affairs was brought about I will now proceed to describe.

The city of Westminster is flat, and on a mean level with average high water in the river. It is bounded on the north by Charing Cross, Pall Mall, and the Green Park; on the west by Buckingham Palace, the upper part of Vauxhall Bridge Road, Tachbrook Street, and Bessborough Gardens; and on the east and south by the Thames. The area within this boundary is about 700 acres. Until fourteen years ago its sewers discharged direct into the river, about 4½ feet above low water level of springtides, and 3½ feet below Ordnance datum. While the flap-valves on their outlets were tide-locked, the drainage accumulated behind them about 1½ feet in depth in dry weather, and from 2½ to 3½ feet in depth in wet weather. Hence the accumulated drainage, in dry weather, was 2 feet below, and in heavy rainy weather level with, Ordnance datum; and hence, the sewers, except near the outlets, were never flooded by the drainage. As the Bridge Street sewer drained only a small area, the accumulated drainage there, when the flap-valve on its

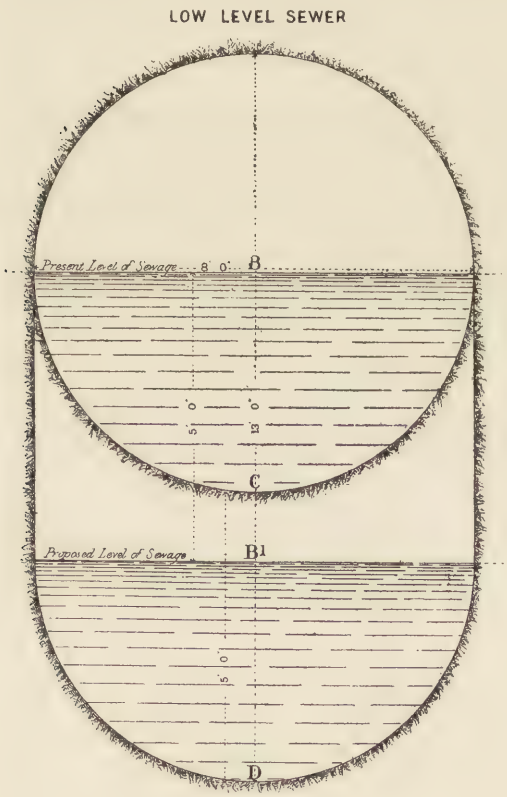
outlet was tide-locked, never prevented the drainage in the Palace sewer from freely discharging into it.

The main low level sewer runs from the western pumping station at Grosvenor Road, Chelsea, to the eastern pumping station at Abbey Mills, West Ham, the length being eleven miles. The shape of the sewer is a circle, varying from 6 feet 9 inches to 10 feet diameter; and its fall is 1 in 2640, or 2 feet per mile. At Chelsea, the sewage and rain-water of Hammersmith, Fulham, Kensington, and Chelsea are pumped up into it from a depth of 17 feet. At West Ham this drainage, together with that which it receives along its course from Pimlico, Westminster, part of London, Limehouse, and Poplar, is pumped up from a depth of 40 feet into the high level sewer, which runs to the reservoirs, discharging into the Thames at Barking Creek. Through Westminster the low level sewer is 7 feet 9 inches in diameter. When it was put down, the sewers there, including the Palace sewer, were connected with it. Where the Palace sewer joins the low level sewer, the former is 3 feet 1 inch, and the latter 4 feet 10 inches below Ordnance datum. In dry weather the average depth of sewage flowing in the low level sewer is 4 feet. Its average surface level is consequently 10 inches below Ordnance datum, and, therefore, it forms a permanent head or dam 2 feet 4 inches deep against the outlet of the Palace sewer. This sewer was thus converted into an elongated sewage pond and sewage gas retort, 200 feet in length. For fourteen years the Palace sewage and rain-water, instead of flowing clear away, as it had done for a quarter of a century previously, discharged through this extended sewage pond. In it the organic matters contained in the Palace sewage were held back by a slightly raised penstock, and two flap-valves, until they were washed away by the flushing water. The outer flap-valve was recently found to be standing permanently open 10 inches from its seat at the bottom, thus permitting not only the sewage in the low level sewer, but the sewage gas generated therein, to flow into the Palace sewer through the open spaces at the sides of the flap.

The height to which the sewage formerly accumulated in dry weather in the Westminster and Pimlico sewers, when the flap-valves on their outlets were tide-locked, has been raised by the increased height to which the sewage is now always flowing in dry weather in the low level sewer. This increased height has caused long lengths of these sewers to be permanently flooded with sewage, and has converted them into sewage gas retorts. In wet weather also, as the low level sewer was calculated to hold only a quarter of an inch in depth of rain per 24 hours falling on the districts draining into it, all the rain which it receives therefrom beyond that rate of fall, and which it cannot store, or the engines at West Ham cannot pump out fast enough, overflows into the sewers in Westminster and Pimlico, and as these fill, it also overflows into and pollutes the river, contrary to the object for which the main drainage works were designed and executed, namely, to free the river through the metropolis from sewage pollution. It is attempted to prevent these sewers from being flooded from the low level sewer by placing flap-valves on their outlets. This expedient, as it again, as it were, tide-locks the sewers and converts them into sewage and rain-fall reservoirs, proclaims that the low level sewer is greviously at fault. Every time rain falls on the districts draining into the low level

sewer, the rain and sewage together sometimes fill it, and sometimes rise to 5 feet, and even 10 feet above its crown. At such times the sewers in Westminster and Pimlico, as well as the basements of many houses there, are not only flooded to the hydraulic level the foul drainage rises in the low level sewer, but as the drainage fills the low level sewer itself, and overflows thence and fills the sewers connected therewith, it forces the sewage gases generated in the sewers up the gully drains into the streets, and up the house drains and through the syphon traps into the houses—the low level sewer being almost entirely unprovided with any other means for ventilating it. This condition of things in underground Westminster and Pimlico, contaminating as it does the atmosphere in which the people live and breathe there, should not be tolerated or allowed to continue any longer.

It is evident from the foregoing particulars and facts, concerning the drainage of Westminster and Pimlico, that the low level sewer has materially injured instead of benefited the sewers in those districts, which therefore, as regards their drainage, are far worse off now than they were when they drained direct into the Thames. The principal cause of this state of affairs is the level at which the low level sewer has been laid, namely, at least 5 feet higher than it should be laid for properly draining the low flat districts through which it passes. The real remedy for the evils which arise from the insufficient depth and capacity of this sewer consists (1) in lowering its bottom from near the District Railway Station at Charing Cross to the western pumping station at Chelsea, as shown from C down to D in the accompanying diagram, a depth of 5 feet, the level at D being about 2 feet below low water level of spring tides; (2) in lifting the drainage near the railway station a height of about 20 feet by compressed air (having a pressure of about 10 lbs. on the square inch above the pressure of the atmosphere), to be admitted into suitable ejectors placed underground near the low level sewer, and discharging into the same sewer beyond; and (3) in thoroughly ventilating the sewer in sections from end to end by fresh air downcast and foul air upcast pipes, the latter discharging considerably above the housetops. By this plan the surface of the sewage, which is now at B, would be lowered to B 1, a depth of 5 feet; and the discharging capacity of the sewer for rainfall, up to Ordnance datum level, would be 3000 cubic



feet per minute more than it is when the existing sewer is running full. If this improvement be carried out the rain-water level in the sewer would also be lowered at least 5 feet; the sewers in Westminster and Pimlico would freely and continually discharge the sewage in dry weather down to B 1 instead of at B as they do now; and the elongated ponds of nearly stagnant sewage emitting sewage gas, which now largely prevail in the sewers, especially at Whitehall, where the Government offices are situated, would be done away with; and the result would be that the sewers in Westminster and Pimlico would drain those districts sanitarily, so far as the *combined system* will permit this to be done.

Reverting now to the Palace of Westminster. Early in 1886 unpleasant smells were experienced in the Palace to such an extent that Parliament had no alternative but to refer the subject to a Select Committee of the House of Commons, Sir Henry E. Roscoe, F.R.S., being the chairman. The chief officials of the Palace, in their evidence, ignored the possibility of sewage gas coming into the Palace from any sewer or drain beneath it, or from the low level sewer outside into which the Palace main sewer drained. Their fixed idea seemed to be that the smells complained of in the Palace were brought there by the wind from distant chemical, oil, and candle works, or dust yards. However, a member of the Committee, Mr. L. H. Isaacs, M.P., who surveyed the main sewer under the Palace, was examined. His opinion was that the smells so frequently experienced in the Palace came not only from the accumulated sewage always lying in the lower end of the Palace main sewer, but from the low level sewer outside, into which it discharged.

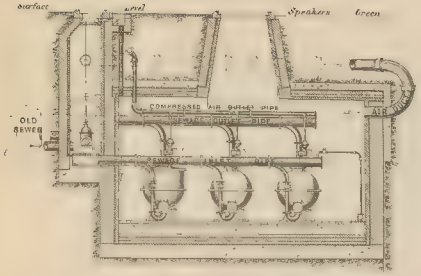
The Committee summoned me before them to give evidence on the subject. The following were my chief proposals :—

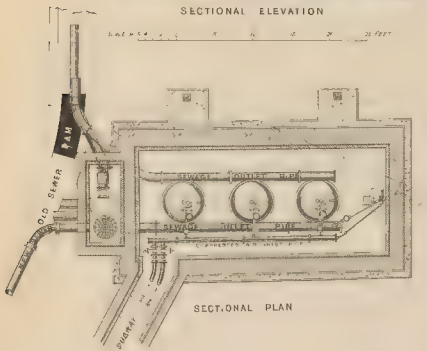
> *Firstly.*—That while the Metropolitan low level sewer should continue to be the outfall for the Palace drains and sewers as at present, yet the arrangements should be such that neither rain nor flood water, nor sewage and sewage gas, should by any possibility come from the former into the latter. *Secondly.*—That inside the Palace main sewer a small egg-shaped sewer, having a fall of 1 in 212, be constructed of white glazed fire bricks, and all existing drains be properly connected therewith. *Thirdly.*—That at the lower end of the egg-shaped sewer, under the Speaker's Green, the sewage and rainfall of the Palace be continually discharged into the low level sewer by three of Shone's Pneumatic Ejectors worked by compressed air, produced by three gas engines—only one ejector and one engine to be used in dry weather, and one or both of the remainder as required during wet weather. *Fourthly.*—That the small egg-shaped sewer be ventilated by a fresh air downcast pipe carried into its lower end, and a foul air upcast pipe carried from its upper end into the ventilating shaft going to the top of the Victoria Tower.

The Committee in their second report stated as their opinion that if these proposals, with others, were carried into effect, the Houses of Parliament, so far as the ultimate disposal of the sewage from the Palace, and so far as this main sewer is concerned, would have been placed in a satisfactory condition. Upon this, the First Commissioner of Works appointed Mr. Isaac Shone, C.E., the engineer to prepare the drawings and specifications, and to superintend the works; and he appointed myself the resident engineer.

The recommendations of the Committee have been substantially carried into effect, and under the Speaker's Green an ejector chamber, 29 feet deep from the surface, and 38 feet long, by 13 feet 6 inches wide, in the clear, has been constructed of blue bricks

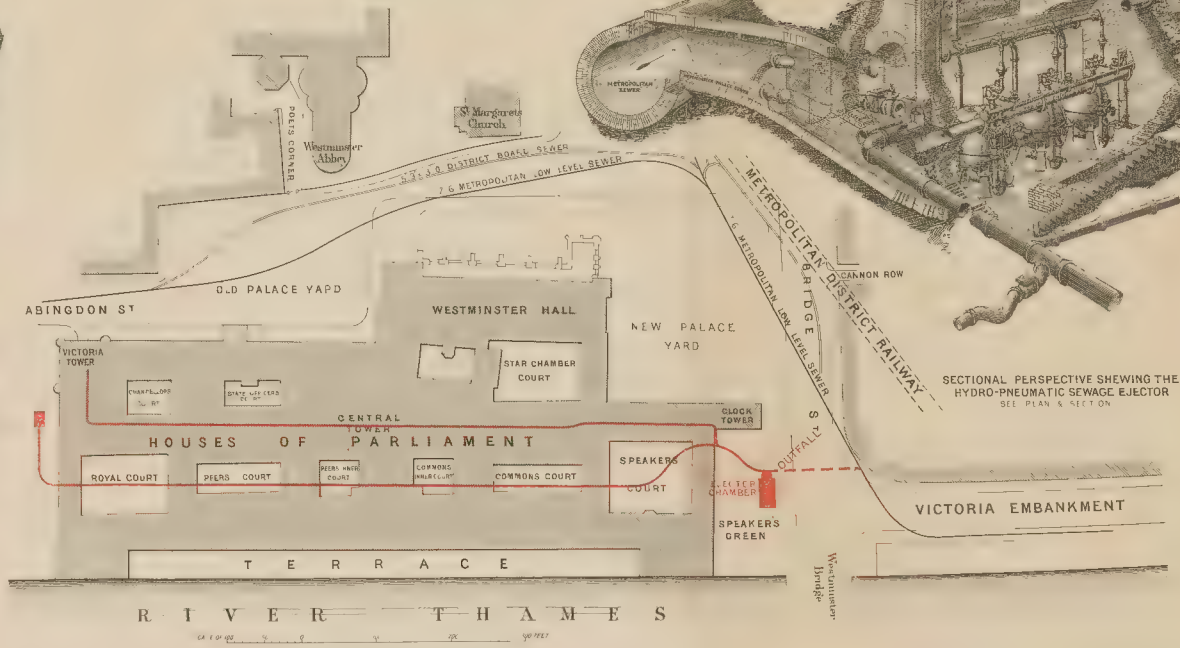
XXXVI THE DRAINAGE OF THE PALACE AND CITY OF WESTMINSTER. (XXXVII)





HYDRO-PNEUMATIC SEWAGE EJECTOR CHAMBER

See page 157



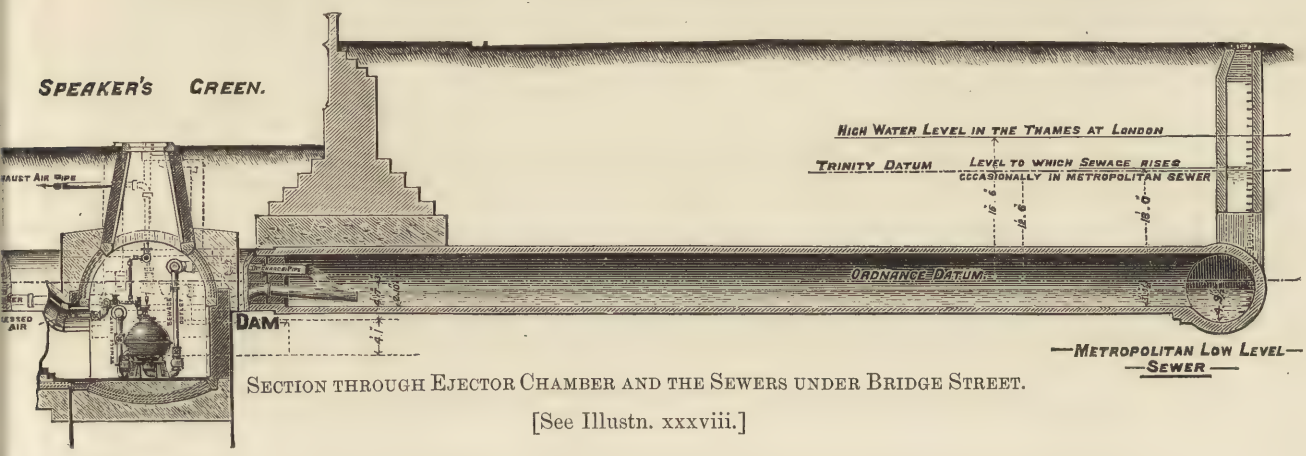
GENERAL BLOCK PLAN.

SECTIONAL PERSPECTIVE SHEWING THE HYDRO-PNEUMATIC SEWAGE EJECTOR

SEE PLAN & SECTION

Back of
Foldout
Not Imaged

in cement, lined with white glazed fire bricks [Illustn. xxxviii.]. It is lighted from the surface, by a shaft in the crown 6 feet long by 4 feet wide covered with Hayward's glass prisms. Three cast-iron ejectors are placed in the chamber, the discharging capacity of one being 480 gallons, and of the other two 335 gallons each. Outside the west end of the chamber there is a sewage manhole. Into this, through one side near the bottom, all the sewage and rainfall of the Palace are discharged; and from the opposite side, 2 feet lower, a 12-inch cast-iron pipe is carried horizontally into the ejector chamber, the end of the pipe having an inspection cap screwed thereon. From the 12-inch pipe, 6-inch cast-iron pipes pass vertically downwards, delivering the sewage and rainwater into the ejectors. In each 6-inch delivery pipe there is a cast-iron box, containing an 8-inch diameter lignum vitae spherical ball. This ball falls below its seat when the ejector is filling, and rises up tight against its seat when it is discharging.



SECTION THROUGH EJECTOR CHAMBER AND THE SEWERS UNDER BRIDGE STREET.

[See Illustn. xxxviii.]

From the bottom of the ejectors 6-inch cast-iron pipes pass vertically upwards into a 12-inch cast-iron horizontal outlet pipe. The end of this pipe in the chamber has an inspection cap; the outlet end is carried through a solid brick dam [see diagram], entirely closing up the Palace sewer, and discharging beyond the dam into the low level sewer about 1 foot above the normal sewage flow therein. In each 6-inch discharging pipe from the ejectors there is also a cast-iron box, containing an 8-inch diameter lignum vitae spherical ball. This ball rises above its seat when the ejector is discharging, and falls down tight on its seat when it is filling. There is ample room round the balls for all ordinary substances put down waterclosets and sinks to pass freely away. Each valve box has a cap screwed on its side for examining or changing the ball at any moment. There are also screw valves on the 6-inch delivery and discharge pipes for opening and closing these pipes when required. Hence the main inlet and outlet pipes in the chamber, the branch inlet and outlet pipes to and from the ejectors, and the ball valves, are all under command at any minute.

All the sewage and rainfall of the Palace are brought to the ejectors by a 12-inch cast-iron main pipe, which is embedded, along the bottom of the old main brick sewer, in cement concrete. The length of this pipe is about 1000 feet, and its fall is 1 in 212.

It receives along its course about 120 drains ; and also two 9-inch main cast-iron branch drains, which receive along their course all the sewage and rainfall drainage of the east and west sides of the Palace. In the top of the 12-inch and 9-inch main drains, where the various contributing drains are joined to them, there are 50 screw-down cast-iron inspection covers for examining the drains when required. At the head of the 12-inch main drain, and at the head of the western 9-inch branch drain, a Shone's Automatic flushing ejector is placed [Illustn. xxxviii]. These admirable appliances are regulated so as to fill, discharge, and flush the drains, automatically once a day. The crown, sides, and floor of the old main brick sewer have been rendered with cement. It has thus been made into a dry subway, and may be utilized as a reservoir in the event of extraordinary heavy rains or storms overpowering the ejectors.

The compressed air for ejecting the sewage and rainfall from the ejectors into the low level sewer is produced by Atkinson's differential gas engines, which are placed in the basement of the Palace, near the warming and ventilating appliances, about 650 feet distant from the ejector chamber. There are four of these engines of 4 horse-power each. Only one engine is at work in dry weather, and also in moderately wet weather, as it compresses sufficient air to eject the sewage and rainwater together during all moderate rainfalls. When heavy rains occur a second engine is put to work to compress the quantity of air required to eject the additional quantity of rain coming to the ejectors. The remaining two engines are kept in reserve, and may be put to work at any minute. The average quantity of cannel-coal gas consumed by one engine per day of 24 hours, constantly working, is about 1,700 cubic feet, or 71 cubic feet per hour. This costs, at 3s. 9d. per 1000 cubic feet, a trifle over 3¼d. per hour.

The compressed air, as it is produced by the engines, is conveyed by a 6-inch cast-iron pipe into 3 cylindrical wrought-iron receivers placed near the engine-room. From these the compressed air is conveyed by a 6-inch cast-iron pipe northward along the basement, and thence along a subway under the Speaker's Green to the ejector chamber. From this pipe 3-inch wrought-iron pipes convey the compressed air into small cast-iron horizontal cylinders fixed on the ejectors. Each cylinder contains a slide valve, and a main valve, with two ports. One of these admits the compressed air into, and the other discharges it from, the ejector. The slide valve is moved to and fro, and permits the compressed air to drive the main valve into positions so as to open the inlet port and close the outlet port, by a simple and effective automatic bell-and-cup arrangement placed within the ejector. The cup is near the bottom, and the bell, which is inverted, is near the top. Both are connected by a vertical iron spindle, which is continued through a stuffing box in the top of the ejector to a lever which is actuated by the rising and falling of the spindle moving the slide valve and main valve to and fro, and so the ports are opened and closed through which the compressed air passes into and out of the ejector.

How the automatic action of ejection is produced is as follows:—As the sewage running into the ejector rises outside and above the bell, it sufficiently buoys the bell, and also compresses and buoys the air inclosed in the bell, to lift the cup, bell, and

connecting spindle, high enough to actuate the lever upwards. This movement carries the slide valve over the port through which the compressed air passes, and drives the main valve over the port which opens into the ejector. Thereupon the compressed air instantly rushes down upon the sewage, forcing the inlet ball down on its seat (thus preventing the sewage from returning back through the inlet pipe), and also forcing the outlet ball up from its seat, and ejecting the sewage up into the outlet pipe—in less than half a minute. When the sewage in the ejector has fallen to the lip of the cup, it continues to fall, leaving the cup brimfull, until the liquid in the cup above that in the ejector is of sufficient weight to pull down the cup, bell, and connecting spindle, low enough to actuate the lever downwards. This movement reverses the position of the slide valve, carrying it over the port through which the compressed air passes, and drives the main valve over the port opening from the ejector. Thereupon the compressed air, which has done its work in ejecting the sewage, instantly escapes by the exhaust pipe; the outlet ball falls down on its seat, and is kept there by the weight of the column of sewage contained in the outlet pipe; the inlet ball is lifted off its seat by the weight of the column of sewage contained in the inlet pipe; and the sewage is admitted into the ejector. This, when full, is again ejected in the same way; and thus the process goes on continuously while there is drainage to flow in, and compressed air to eject it out. This ingenious automatic bell-and-cup arrangement works slow or fast according to the quantity of drainage coming to the ejectors. The machinery requires no other attention than occasionally cleaning and oiling the joints, and the slide and main valves. As each ejection is completed, the used compressed air in the ejector discharges instantaneously by a 3-inch wrought-iron pipe into a 6-inch cast-iron main pipe, which leads into the ventilating shaft going to the top of the Clock Tower.

The height to which the sewage is ejected in dry weather, from near the bottom of the ejectors to the top of the outlet pipe discharging into the low level sewer is 11½ feet. The air compression above the atmospheric pressure necessary to eject the sewage this height is $= 11{\cdot}5 \times {\cdot}434 = 4{\cdot}991 + {\cdot}159$ for friction $= 5{\cdot}25$ lbs. on the square inch. The height to which the sewage and rainfall are required to be ejected varies according to the hydraulic level of the drainage in the low level sewer. When the flood level in this sewer is 8½ feet above the main outlet pipe from the ejectors, the maximum lift is 20 feet. Then the air compression, above the atmospheric pressure, necessary to eject the sewage and rainfall this height is $= 20 \times {\cdot}434 = 8{\cdot}68 + {\cdot}32$ for friction $= 9$ lbs. on the square inch. In order, however, to be prepared for emergencies arising from sudden or excessive rainfalls, the air compression is always maintained at 10 lbs. on the square inch.

The quantity of compressed air consumed by the ejectors is always equal to the quantity of sewage, or of rainfall and sewage, discharged by them. Thus, each time the 480-gallons ejector discharges it consumes 480 gallons of compressed air. Each ejector invariably discharges a little under half a minute; and as each is capable of filling in the same time, each fills and discharges in less than a minute. The discharging capacity of the three ejectors is equal to 1,150 gallons. This is the maximum quantity of sewage and rainfall they are capable of discharging per minute when working simultaneously.

Since the ejectors have been at work the number of times each has discharged has been registered. The result is, as regards the sewage discharged in dry weather, 40 gallons per minute, which is the quantity of sewage produced in the Palace per minute from all sources. Subtracting this quantity from 1,150 gallons, the remainder, equal to 1,110 gallons, is the quantity of rainfall the three ejectors are capable of discharging per minute. This is equal to a rainfall on the 10½ acres draining to the ejectors of ·28 inch in depth per hour, or 6·72 inches per twenty-four hours. This is equal to 178 cubic feet per minute, which is the quantity the 12-inch main drain is capable of delivering per minute to the ejectors. When a rainfall exceeds ·28 inch in depth per hour, or 6·72 inches per twenty-four hours, the excess overflows into the subway reservoir over the 12-inch main-drain. Thence, as the rain subsides, it passes into the sewage manhole to the ejectors, and is ejected.

The ventilation of the main drains has been carried out as follows:—Fresh air is admitted down into the subway through two grated openings let into the footway in the Speaker's Green. From the subway the air is conducted by a branch subway down into the ejector chamber. From the east gable of this chamber the air is conveyed, by a 15-inch cast-iron pipe bending over the crown of the chamber, into the sewage manhole. Thence the air enters the outlet of the 12-inch main drain, and flows up this drain, in the space above the sewage to near its top end. Thence it enters a 12-inch branch pipe, which is connected to a 15-inch cast-iron duct discharging over a furnace in the bottom of the ventilating shaft going to the top of the Victoria Tower, a height of 300 feet. By this means any noxious gases emanating from the sewage are at once conveyed, by the strong air current produced in the ventilating shaft, into the atmosphere above the Victoria Tower. The 9-inch main branch drain, carried under the basement on the west side of the Palace, is also completely ventilated by admitting fresh air into its top end, and discharging the foul air under the furnace at the bottom of the Clock Tower ventilating shaft. The subway over the 12-inch main pipe receives fresh air from the surface through the covers on the old manholes, and also from an opening in the sewage manhole. The air in the subway flows out of it along a 16-inch cast-iron pipe going from under the Speaker's Court to the ventilating shaft in the Clock Tower.

I may here observe, in conclusion, that the new main drains, with the aid of Mr. Atkinson's gas engines, and Mr. Shone's ejectors, immediately and completely convey away all the sewage as fast as it is produced in the Palace, as well as the rain falling thereon. So far, therefore, as these drains are concerned there is now neither stagnant sewage nor stagnant foul air in them.

The total cost of the new main drainage works including the four gas engines, the three compressed air receivers, the pipings, and the three ejectors, has been a little over £11,500.; and I am informed that the Committee before mentioned, the Members of both Houses, and Her Majesty's Office of Works, are highly satisfied with the efficiency of the works as executed.

JOHN PHILLIPS.

XXXV.

THE ARCHITECTURE OF DALMATIA.

By Mr. T. G. Jackson, M.A., F.S.A.

DALMATIA is a narrow strip of country between the mountains and the sea stretching for some three hundred miles along the eastern side of the Adriatic. Its average width is from twenty to twenty-five miles, varying from barely a mile at its southern end in the Bocche di Cattaro to about forty miles at Knin. The high range of the Dinaric Alps, under various different names, parts it from Montenegro, Herzegovina, Bosnia, and Croatia, and between these mountains and the coast the land lies in a succession of parallel ridges which are continued under the sea, their crests forming that singular archipelago of long narrow islands with which the coast is fringed. Towards the sea Dalmatia generally presents a front of arid white limestone rocks, and inland the country consists for the most part of desolate moors and swampy plains, too often the home of ague and fever. Nothing can be in greater contrast to the Italian shores of the Adriatic with their soft landscape and luxuriant vegetation; but the Dalmatian coast has this great advantage over its opposite neighbour that it abounds in magnificent natural havens, while the Italian coast has scarcely any harbour of importance between Venice and Brindisi.

The physical geography of Dalmatia is the key to the history of its civilisation. Although the interior was not always so poor and deserted as it now is, but if we are to believe the ancient writers, was once well wooded, and rich in mines of the precious metals, still the sea has always been the parent of Dalmatian prosperity, and during the Middle Ages it was only on the sea coast and in the islands that the arts of civilised life were able to maintain their existence. While the country behind was overrun by hordes of Goths, Avars, and Slavs, the elements of civil order and something of the arts of the ancient world were kept alive in a few Roman cities, from which, in time, they spread again over the maritime part of the kingdom.

The art of Dalmatia then is entirely urban. Beyond the precincts of the cities it is in vain to look for any traces of architecture later than the time of the Roman Empire, and those scanty fragments of Roman works which represent, with a few battered stones,

the site of ancient cities, are so slight as to have no artistic value, whatever may be their antiquarian interest. The prosperity of Dalmatia expired with that of the Western Empire: during the middle ages she had to battle with surrounding barbarism, and during the last part of her history she has been the victim of decline, ruin and neglect. Her successive rulers have governed her for their own profit, with little regard for the interests of the provincials, and at this moment Dalmatia is confessedly the most backward province of the Austrian Empire. But under the Romans the country was intersected by splendid roads and studded with populous cities, which, if we may judge from their remains, must have been worthy to compare at least with the second-rate provincial towns of Italy. Several of the later emperors were natives of Pannonia, and Diocletian, who was born near the lake of Scutari within the limits of modern Montenegro, chose the Dalmatian coast as the scene of his retirement after his abdication, A.D. 305.

Three miles from the ancient city of Salona, one of the proudest of Roman provincial cities which is now represented by a few broken walls and heaps of stones, Diocletian built his villa of Aspalathus, within the walls of which grew up in aftertimes the city of Spalato. With this building the series of examples of Dalmatian architecture may be said to begin; but its interest is of far wider extent than the limits of a single province. Its importance in the history of architecture in itself is so great that it may fairly be said to mark the beginning of a new departure in art, and to stand at the meeting point of the styles of ancient and modern Europe. In the palace of Spalato the strict rules of classic architecture are relaxed, and the various members of the Order are for the first time used with something of the freedom of mediæval architecture. The building is, therefore, as important to students of modern architecture as to those of the ancient styles. Together with the coeval buildings of Baalbec and Palmyra it marks the era of a new birth in architecture, which in time grew up into the styles of modern Europe. Many of the irregularities of the Classic architecture at Spalato foreshadow forms of Romanesque and Byzantine art as yet unborn. Many members that had hitherto been considered necessary to the Order are arbitrarily omitted, or altered in character and proportion, and treated with a freedom that had not till that time been dreamt of. We find doors with an architrave and a cornice, and no frieze; entablatures without frieze and with no distinct architrave, but only a cornice with two facias below it; elsewhere we find capitals consisting of a plain bell and abacus, like twelfth-century work; the architrave is oftentimes increased in proportion at the expense of the frieze and cornice, till the frieze becomes in some cases little more than a roll moulding, while the cornice almost dwindles into the Gothic string course; decoration by miniature arcading makes its first appearance, and columns and colonnettes rest on projecting brackets; new ornaments, such as the zigzag of the coming Romanesque style, are found for the first time; in more than one part of the building the whole entablature, of architrave, frieze, and cornice, springs audaciously into an arch, and finally by the omission of frieze and cornice, which after all jumped but clumsily, the architrave is left alone to spring directly from column to column without any intervening entablature.

This final emancipation of the arch from the traditions of trabeated architecture is rightly said by Professor Freeman to be "*the greatest step ever taken, the beginning of all "the later forms of consistent arch architecture, Romanesque, Gothic, or any other.*" It is curious that it seems to be connected with Diocletian's buildings, for arches springing directly from the capitals are recorded to have been found in his baths at Rome, although they are no longer in existence.[78] But the step had long been impending, and was very nearly being made long before at Athens, where in the building known as the aqueduct of Hadrian the frieze and cornice are stopped over a column, and the architrave alone springs from it as an arch. Examples of arches springing directly from columns without an entablature are also found in terra cotta panels and sarcophagi which perhaps imply an earlier date for the innovation than the age of Diocletian, though evidence is wanting of the earlier use of this form of arched architecture on a large scale.

These innovations and departures from strict classic precedent, though shocking to the classic purist, will be regarded by those who look at the matter historically and scientifically as evidences of healthy architectural growth and signs of active vitality. But if the palace of Spalato contains the promise of new life and new forms of art, it also bears many signs of the coming barbarism into which the Roman world was doomed to sink before it rose again into the light of modern civilisation. Here, for perhaps the first time in classic architecture, we find the spoils of older buildings used second-hand in the way which was so common a few centuries later when technical skill had sunk lower. The execution of the architectural ornaments also is coarse and inartistic. The different members are richly loaded with ornament, but they are often very roughly cut. In the cymatium of the cornices the foliage is sometimes simply traced on the surface of the moulding, and the ground square sunk; and the same is the case with the egg and dart on the upper member of the architrave, which is worked on a mere splay and not as usual on an ovolo. The best piece of ornamentation is perhaps the scroll work round the doorway of the little temple which now serves as the baptistery of Spalato; but though this shows a good deal of fancy and facility of execution some of the figures are so carelessly chopped out that it is not easy to see what they are meant for, and the Roman work is completely put to shame by some excellent Romanesque scroll work in its neighbourhood.

To attempt anything like a detailed description of the palace would require more time than I have at my disposal. I cannot do better than refer to the magnificent work of Robert Adam on the ruins of Diocletian's palace at Spalato, which, though published more than a hundred and twenty years ago, is still the best authority on the subject. In plan the palace, like the Roman camp, was nearly square, and was divided into four quarters by two streets which intersected in the middle. In the centre of the eastern, northern, and western sides were the gates, of which the two latter, the Porta Aurea and Porta Ferrea, still remain. The southern side is on the seashore, and as the ground falls that way the street level becomes the first floor; the principal street, therefore,

[78] Adam refers to Lord Burlington's drawings of the baths of Diocletian in evidence of this. In the copy at the British Museum, however, I confess I have been unable to verify his reference.—T. G. J.

which runs from the north gate, is not carried through to the south, but stops short at the imperial apartments, to which the whole south front of the building was devoted. Entering by the north gate, the Porta Aurea, one would have advanced by a street about thirty-six feet wide, with colonnades on either hand running straight to the vestibule of the imperial apartments, of which the portico and dome closed the vista. Advancing along this street some three hundred feet one would have reached the centre of the palace, where the cross street fell in from the Porta Aenea and Porta Ferrea, which would be visible in the distance to the right and left. Continuing our advance southwards there is no need for imagination; everything as far as the imperial vestibule remains to this day. Beyond the crossing the low simple colonnades of the north street were exchanged for the lofty and graceful columns and arches of the peristyle, forming on either hand an open screen, through which were seen enclosed courts right and left, each containing a temple, that of Jupiter to the left, that of Aesculapius to the right, while in front, closing the end of the peristyle, was the portico of the vestibule, a circular building with a dome, which has now unfortunately fallen in.

With the exception of the peristyle, the rest of the palace is now encumbered with close courts of lofty houses, among which run narrow and crooked alleys of the meanest description; but the two ancient gateways are still the ordinary entrances of the town, the two temples serve it for cathedral and baptistery, the peristyle forms its piazza, and the outer walls still enclose what was the mediæval city, though modern Spalato has outgrown its ancient limits. Defaced as it is, and choked up with the mean accretions of fifteen centuries, Diocletian's palace may still claim to have preserved for us better than any other relic of the ancient Roman world a picture of the magnificence amid which its masters dwelt.

It is necessary to give a brief description of the two temples on account of the lasting influence they exercised on Dalmatian architecture. The larger of the two—now the Duomo, or Cathedral of Spalato—is externally an octagonal building, mounted on a lofty podium, and surrounded by a peristyle of the Corinthian Order, with wide intercolumniations. Within and above this peristyle rises the octagonal drum of the cella, which finished with a low pyramidal roof. A portico originally projected forward towards the great peristyle of the palace, which has given way not unworthily to an enormous mediæval campanile, the most conspicuous ornament of Spalato. Internally the temple is round, surmounted by a brick dome, and surrounded by two Orders of eight columns, carrying returns of the entablature, which project from the main wall of the cella [Illustn. xxxix.] In the eight intercolumniations are sunk eight recesses, four of them semi-circular and four square, in one of which is the door. Originally the interior was lighted only by the door and a lunette over it, for, by the examination I was able to make of the roof and vault, I satisfied myself that there was no foundation for the theory of a central eye, like that at the Roman Pantheon, and that the building has from the first been covered with a pyramidal roof like the present one. Below the floor is a crypt with a vault of concrete, which rests on piers of its own, independently of the main walls.

XXXV. THE ARCHITECTURE OF DALMATIA (xxxix).





T.G.J. del.

The Phototype Co., 303, Strand, London.

SPALATO

Interior of the Duomo.

[PAGE 164.]

Of the purpose of this building various ideas have been entertained. Constantine Porphyrogenitus, writing in the tenth century, says it was Diocletian's bedchamber, but, according to the general tradition which was unquestioned till modern times, it was a temple of Jupiter which was purged of its idols and consecrated to Christian worship A.D. 650. Several antiquaries, however, among whom was the late Mr. Fergusson, have believed it to be the mausoleum of the Emperor, though others, with Mommsen and Eitelberger, believe him to have been buried not in this but in the other temple, while a third place has been found for his sepulchre in one of the angle towers of the palace, where, according to Tomco Marnavich, a writer of the seventeenth century, his body was discovered in a porphyry sarcophagus. This is not the time or place to argue this question. I will only say that the reasons adduced for believing this temple to be the mausoleum seem to me very inconclusive.

The other temple, generally known as the Temple of Aesculapius, consists of a small rectangular cell with a portico of four columns raised on a lofty podium, and approached by a stately flight of steps. It is now the Baptistery of Spalato, and, except that it has lost its portico, is in almost perfect preservation. It is ceiled with a waggon roof, richly coffered, and it has this remarkable peculiarity, that, though it finished at each end with the ordinary triangular pediment of a classic temple, the roof between these pediments was semicircular, being, in fact, the extrados of the waggon ceiling.

This waggon roof of the one temple, and the peculiar plan of the other, had a prodigious attraction for the minds of Dalmatian architects, and their influence may be traced over and over again on the buildings raised in Dalmatia during the middle ages.

The history of Dalmatian architecture during the five succeeding centuries is almost a blank. The country passed under the dominion of the Eastern Empire in 535, and its architecture, no doubt, thenceforth conformed to the Byzantine style. Unfortunately, the calamities which befel Dalmatia during the Barbarian irruptions that succeeded have left no building of this period standing, and in order to complete a sequence of examples we have to look to the neighbouring countries of Istria and Friuli. At Parenzo, a town of the Istrian Litorale, and on the island of Grado in the lagunes at the head of the Gulf of Venice, there still stand two magnificent Byzantine basilicas, dating respectively from about 540 and 570, which, in their sculpture, their mural mosaics of glass, marble, and mother of pearl, and their magnificent pavements of tesselated work, resemble precisely the Byzantine work in the city of Ravenna on the opposite coast. At Parenzo especially one might imagine oneself in the ancient capital of the Exarchs, though there is no church at Ravenna which is so complete and perfect in its plan, for the basilica of Parenzo has preserved its ancient atrium or cloistered forecourt, westward of which is the great octagonal baptistery, beyond which again is the campanile.[79]

In Dalmatia, as I have said, there is no building of this period still standing, but recent excavations among the ruins of Salona have restored to us the ground plan and

[79] Mr. Jackson showed some drawings of this church, representing the atrium, the interior of the principal apse with its mosaics, and some of the capitals, which, he observed, correspond exactly with several well-known capitals at Ravenna, and might have been carved by the same hand.

various fragments of a considerable basilica, which dates probably from the fifth century. A baptistery also has been discovered with several mosaic pavements, and as the excavations are still in progress, fresh discoveries of interest are constantly being made. Enough has already been found to show that Byzantine art had established itself firmly in the country, all the more readily, doubtless, because the classic work which preceded it is tinged with Greek feeling, and the capitals of Diocletian's palace are raffled in that crisp and delicate way which is characteristic of Byzantine sculpture.

The plan of the basilica of Salona, of which, by the kindness of my friend Professor Bulić of Spalato, I am able to show a drawing, presents many remarkable peculiarities. It is preceded by a narthex, westward of which it is expected that further excavation will expose an atrium; it has a nave with aisles and nine arches on each side, and in the eastern part of the nave is a place for the choir, consisting of a narrow enclosure, only 8 feet 6 inches wide, which was surrounded by a dwarf wall. Beyond this the church was crossed by a solid wall, which from its massive construction must have run up the full height of the building, and cut it completely in two. This is a feature to which I know no parallel elsewhere. The wall is pierced by five small doors, and beyond it was a transept and an apse. Another singular feature in the plan is an additional aisle or corridor outside the church to the north, from which a number of apsidal chapels open, each with its altar raised on a flight of steps. These buildings are not all of one date, for many of the stone sarcophagi which stand thickly round the church are set across the foundations of some of the chapels, which must, therefore, have been destroyed while the basilica itself was still in use. More curious still is the state of things revealed by excavation below the floor level of the church, which appears to have been built on an ancient cemetery, for the area is full of sarcophagi thrown about in strange disorder, over which the earth had been simply filled in and levelled to afford a foundation for the walls and piers of the basilica. At least a hundred and fifty of these huge stone arks stand within or around the church, and it is difficult to conceive a stranger spectacle than that which they present. Some of them, which were finely sculptured, have been removed to the museum at Spalato.

Except these remains at Salona, we have nothing to tell us anything of the arts of Dalmatia from the fourth century to the ninth. The province had more than its share of the calamities which swept over the Roman Empire in the fifth and succeeding centuries. The Eastern Empire was too distant, and too much engaged nearer home, to afford any real protection. Hordes of Goths, Avars, and Slavs wasted the province and drove the old Roman population to the strongholds of the mountains or the shelter of their city walls, and at last in the seventh century the cities themselves succumbed to the invaders. Salona was taken and entirely destroyed in 639; and its fate was shared by Scardona, Narona, Jadera the modern Zara, and Epidaurus the oldest Greek colony of Illyria. The whole country was occupied by settlements of Croats and Serbs, who, like our own Saxon forefathers, being lovers of the open country and haters of towns, were contented to let the cities remain in ruin without attempting to occupy them.

The old Latin or Roman population of the cities was not however crushed out of

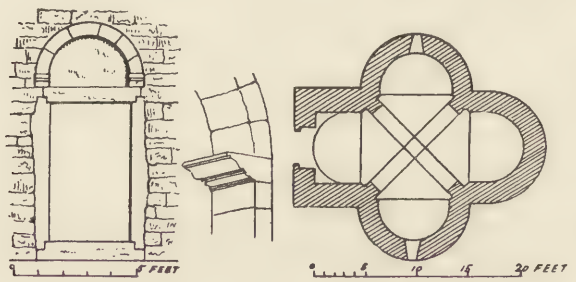
existence by these calamities. From their hiding places in the islands the exiles either returned to their old homes, or founded new ones when the shock was over, and, as their Slavonic conquerors acknowledged the sway of the Eastern Empire, a mandate from Constantinople secured the returning fugitives against further interference. Zara rose again from her ashes; the fugitives from Epidaurus settled on an isolated rock not far from their ancient home, where they founded the city of Ragusa, and the unhappy Salonitans, not daring to rebuild their ancient capital, which lies to this day a heap of stones, crept back in reduced numbers and sheltered themselves within the mighty walls of Diocletian's villa of Aspalathus, which they converted into the modern Spalato.

From this time forward Dalmatia presents the spectacle of two distinct peoples living side by side, of different race, language, customs, and aspirations, and to a certain extent with different religious proclivities. In the towns of Zara, Traü, Spalato, Ragusa, and Cattaro on the mainland, and those of Arbe, Veglia, and Ossero on the islands, were the Romans, or as they came to be called *Dalmatians*, in contra-distinction to the Croats or Serbs, speaking their ancient tongue, governing themselves by their old Roman law, electing their own magistrates and bishops, and preserving the traditions of the municipalities of the empire. Beyond the city walls and the narrow territory owned by the citizens, the country was settled by Croats in northern and Serbs in southern Dalmatia, living at first in distinct communal societies with little coherence, which afterwards became absorbed and compacted into the dukedoms and kingdoms of Croatia and Servia. Both Romans and Slavs at first owned the supremacy of the emperor at Constantinople, and received officers and dignities from his hand. The weakness of the cities at first obliged them to pay tribute to the Slavs as the price of tranquillity; but in time they grew strong enough to protect themselves, and after the entrance of Venice and Hungary into the field of Dalmatian politics had crushed the independence of Croatia, the cities came again to the front, and the subsequent history of Dalmatia is, in fact, little more than the history of the maritime towns and the Latin population. Throughout the middle ages this distinction of Latin and Slav was never lost; it survives to the present day and is the key to the proper intelligence of Dalmatian politics. Till the last few years the Latins have had things pretty much their own way; but since the great uprising of the Slav nations of the interior of the Balkan peninsula the Croats of Dalmatia have bestirred themselves, and with the aid of the Austrian Government are trying to Slavonize the Latin cities and to stamp out the Italian language. The other party clings with passionate ardour to its ancient "*Coltura Latina*," and the issue of the contest is still doubtful. I, for one, cannot contemplate without regret the possibility of the extinction of an ancient culture and the suppression of an ancient tongue which can boast an uninterrupted descent from the Roman Empire.

Among the Slavs arts and letters made little sensible progress, while the Latins of the cities were no sooner secured against the attacks of their barbarous neighbours, than they began to develop a considerable commerce, and to rival the Italians themselves in the arts of peace. While the country was still subject to the Byzantine Empire, Dalmatian archi-

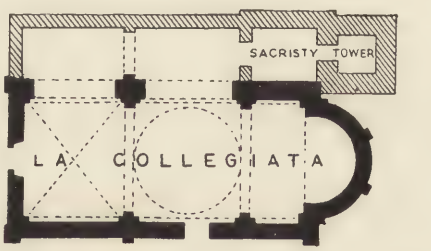
tecture naturally reflected the style of the mistress city. The buildings of this period, which have come down to us are, for the most part, small and rudely finished. In a humble way the two classes of Byzantine churches, the domed church and the basilica, are represented. Some of the latter class consist of a nave with aisles, others of a double nave divided by a central arcade; they are waggon-vaulted, with flat ribs laid under the vault at each column, and the east end is finished with a semi-dome. They have however, one peculiarity which is worth noticing, which is, that the ground plan of the east end is square, and at the springing of the apse-dome is brought to the semi-circular plan by squinches in the angles. This is a device of which the Dalmatians were so fond that the aisles of the little church of S. Lorenzo at Zara are vaulted with a succession of semi-domes, facing sideways to the nave, being carried on squinches in the way I have described. The largest basilican church (*ναὸς δρομικός*) of this period was the cathedral of S. Anastasia at Zara, which is described by Constantine Porphyrogenitus in the tenth century as decorated with painting and paved with mosaic, and constructed with columns of white marble and cipollino, which were, no doubt, the spoils of ancient temples. The greater part of this church was rebuilt in the thirteenth century.

Of domed churches there are several varieties. At Nona are two churches (Figs. 1 and 2), in plan a Greek cross, barrel-vaulted, apsidal, with a central cupola of an ovoid



S. NICOLO'

Fig. 1.



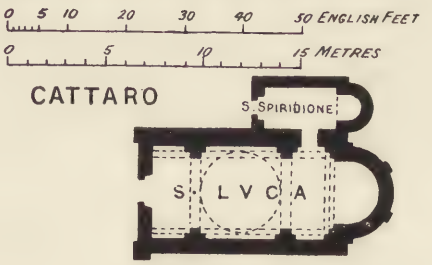
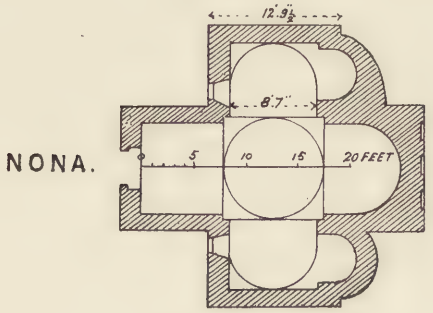


Fig. 3.



NONA.

S. CROCE

Fig. 2.

form rudely carried on pendentives and concealed within a central tower. At Cattaro there are two churches (Fig. 3), which, though rebuilt in later times, probably retain

the original plan, consisting of cupolas rising from an elongated nave which finishes with an eastern apse. The size of these buildings is generally insignificant, and at S. Croce (Fig. 2), which was the cathedral of Nona, the dome is only about eight feet in diameter, and each arm of the cross about eight feet long. Another group of churches is still more remarkable in plan; they consist of a central domed space, surrounded by six apses of inferior height. I cannot but think that their curious plan is derived from the circular temple of Diocletian at Spalato, with its surrounding recesses or niches.

Nothing can be said with certainty as to the date of these buildings, except that they were built at some time between the year 800 and the year 1100. Some of them are more barbarous than the rest and contain no original details, the only wrought stone about them being fragments of old Roman buildings put together without art, upside down, or inside out, just as it might happen. These are probably the oldest among them. Others have some original details, which, though barbarous enough, still show a slight degree of progress, and these may probably be placed towards the end of the period. Fortunately, the most remarkable church among them is the one about whose date there is the least doubt: this is the grand round church of S. Donato at Zara, which was undoubtedly built by Donato III., Bishop of Zara, shortly after A.D. 800.

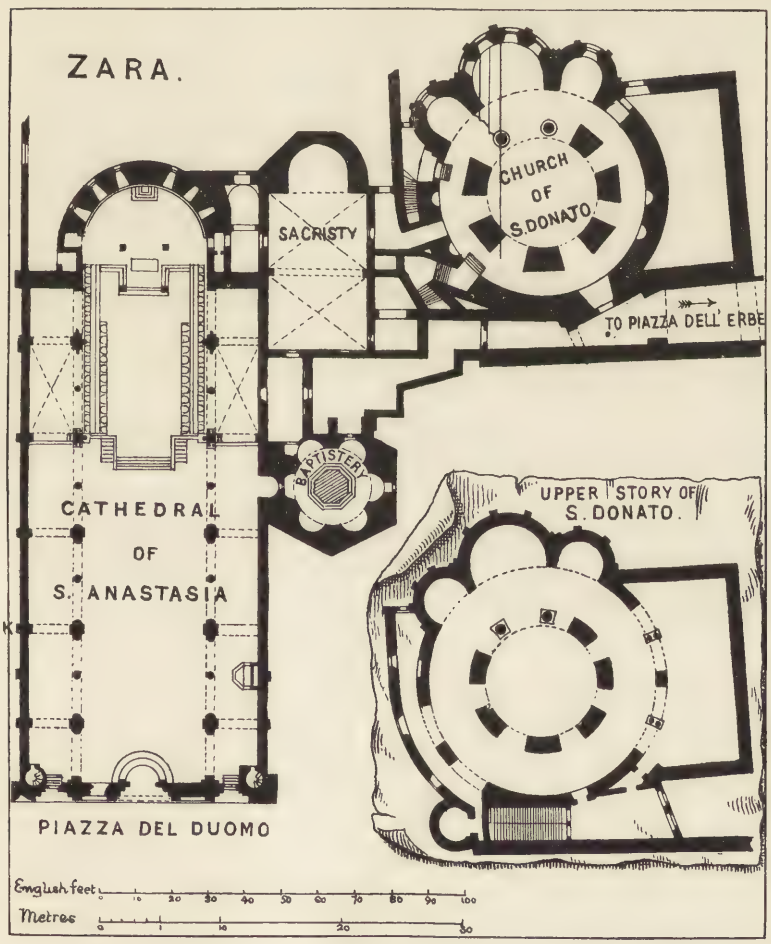


Fig. 4.

S. Donato is one of a remarkable group of five churches, all adjoining and opening into one another, of which the principal is the Cathedral of S. Anastasia (Fig. 4). In the tenth century the church of S. Donato was dedicated to the Trinity, and Constantine Porphyrogenitus

describes it as having "*above it another church, as if for catechumens, which is vaulted like "the first, to which also they go up by a winding staircase.*" The church, in fact, consists of a circular central space which was domed, surrounded by a double-storeyed aisle, which, as the upper aisle is as large and important as the lower, answers the description of Porphyrogenitus of a second church above the first. On the east side a triple apse is projected on each of the two storeys. The central space is divided from the aisle by eight piers, six of which are huge masses of plain masonry which are actually wider than their inter-columniations, and the remaining two are antique columns with ancient capitals. Time does not permit me to dwell at length on the various peculiarities of this interesting building, nor on certain adjuncts to the circular plan, which, I believe, I discovered. The building, though simple and rude even to the verge of barbarism, is not without a certain mysterious dignity. In its plan [S. Donato in fig. 4] one cannot fail to be struck by its resemblance to two churches of greater fame, that of S. Vitale at Ravenna, and the Cathedral of Aix-la-Chapelle; and this is consistent with the history of its builder, Bishop Donato, the Ambrose of Zara as he has been called, whose travels extended from the Court of the Emperor Nicephorus at Constantinople to that of Charlemagne at Thionville.

I must not however omit one, perhaps the most curious, of the wonders of S. Donato. Into one of the piers is built a marble block bearing a dedicatory inscription IVNONI AVGVSTAE, which was known and published as long ago as the fifteenth century, and which misled many writers to suppose the building to have been originally a Pagan temple. In 1877, however, it was discovered that this was only one of an immense number of fragments of ancient buildings of the best period of Roman art which were used up in the construction of the church. The floor was excavated to the depth of about four feet, where was found the original pavement of a Roman forum on which without any other foundation the Christian church was built. On this pavement had been disposed huge fragments of classic cornices, dedicatory inscriptions, mouldings, bases, friezes, some upside down, some on end, in strange confusion, and among them a quantity of columns broken into lengths and laid simply on their sides without any attempt to give them a level bed. This heterogeneous mass had been filled in with earth and rubbish, and the rude walls and piers of the Christian church were raised upon them as if to express the contempt of the new religion for Pagan rites and Pagan splendour.

The political events which befel Dalmatia at the opening of the twelfth century entirely altered the current of her architecture as they did that of her history. By the Hungarian conquest of the kingdoms of Dalmatia and Croatia their connection with the Byzantine Empire, which had long been merely nominal, was finally broken off; during the next three hundred years Venice and Hungary contested the possession of Dalmatia, and the arts of that country bear the stamp of the schools of Italy and Germany rather than that of Constantinople. In other words, the architecture passed from Byzantine to Romanesque, from the eastern to the western form of modern round-arched architecture.

The Hungarians themselves were not an artistic people, and at the time of their

conquest of Dalmatia they were no doubt less civilised than the people of the old Roman cities. At that time, and even for several centuries after, they were obliged to employ foreign architects; and one of the most interesting memoranda in the sketch-book of Villard de Honnecourt refers to his being sent for to Hungary where he was apparently employed in rebuilding churches which had been destroyed during the great Tartar invasion which desolated Hungary in 1241. As a rule Hungarian architecture is based on that of the neighbouring countries of Austria and Carinthia, whence no doubt architects were generally invited, and it consequently bears the stamp of German influence. It is interesting to find traces of German feeling in several Dalmatian buildings, especially in those places which like Traü were longest under Hungarian rule, while the influence of Byzantine art lingers longest in the islands and in those cities of the mainland like Zara and Ragusa which remained more constantly under the dominion of the Venetians, who clung to the Byzantine style to a comparatively late period.

The series of Romanesque buildings in Dalmatia begins with the fine campanile of S. Maria at Zara, and the chapter house of the adjoining convent, which were built the one by King Coloman to commemorate his conquest in 1105, and the other by the Abbess Vekenega his repudiated wife. The tower with its flat unbuttressed outline, its round-headed windows set in shallow panels, increasing in number as the storeys rise, and divided by "*midwall*" shafts, to use Professor Willis's term, belongs to a well-known Romanesque type of which the series runs from Rome to Verona and from Lombardy to Cologne. To the end of the same century belongs the magnificent companile of the island city of Arbe in the Quarnero, with the three lesser steeples which like satellites attend it, and render Arbe one of the most romantic and picturesque places I have ever seen. In point of finish and execution, no less than in their general design and conception, these Dalmatian campaniles will compare favourably with any of the same class in countries that are better known.[80]

In the same city of Arbe is the ruin of an interesting church remarkable for the plan of the east end, which consists of an apse surrounded by an ambulatory in the fashion rather of northern Romanesque than of the schools south of the Alps. This feature belongs indeed rather to the Romanesque of France or England than to that of Germany, in which country it was never popular. I cannot recall an instance of it among the Romanesque buildings of Italy, and cannot explain its appearance on this remote island of the Quarnero.

I have endeavoured to trace the influence of foreign schools on Dalmatian architecture, but it has one characteristic which must be accounted for by the historical conditions and natural taste of the Dalmatians themselves, and that is their resolute persistence in the Romanesque style long after it had passed into Gothic in other

[80] Mr. Jackson showed drawings of the campanile of S. Maria at Zara, and that of Arbe. Also of an interesting early ciborio or baldacchino in the Duomo of Arbe; of the apse of S. Grisogono at Zara, which dates from about 1175, and is a beautiful example of refined Romanesque resembling that of Lucca; and of the apse of the curious two-storeyed church of S. Quirino on the island of Veglia. All of these examples date, he stated, from the twelfth or early part of the thirteenth century.

European countries. In France and England round-arched gave way to pointed architecture at the end of the twelfth century, and though the change took place later in Germany the pointed arch made its appearance and Romanesque began to decline about the middle of the thirteenth century. In Italy Gothic reached its development between 1220 and 1300, but in Dalmatia we find Romanesque architecture, with but little sign of change or progress, prevailing well into the fourteenth century, and examples are not wanting even as late as the fifteenth. The Duomo of Zara which was built in the thirteenth century, and not consecrated till 1285, might easily be mistaken for a church of the eleventh or twelfth century, and it has a west front actually dating from 1324, with round-arched portals, wheel windows, and tier above tier of Romanesque arcading in the style of the Duomo of Pisa or Lucca, or the church of S. Michele at Pavia.

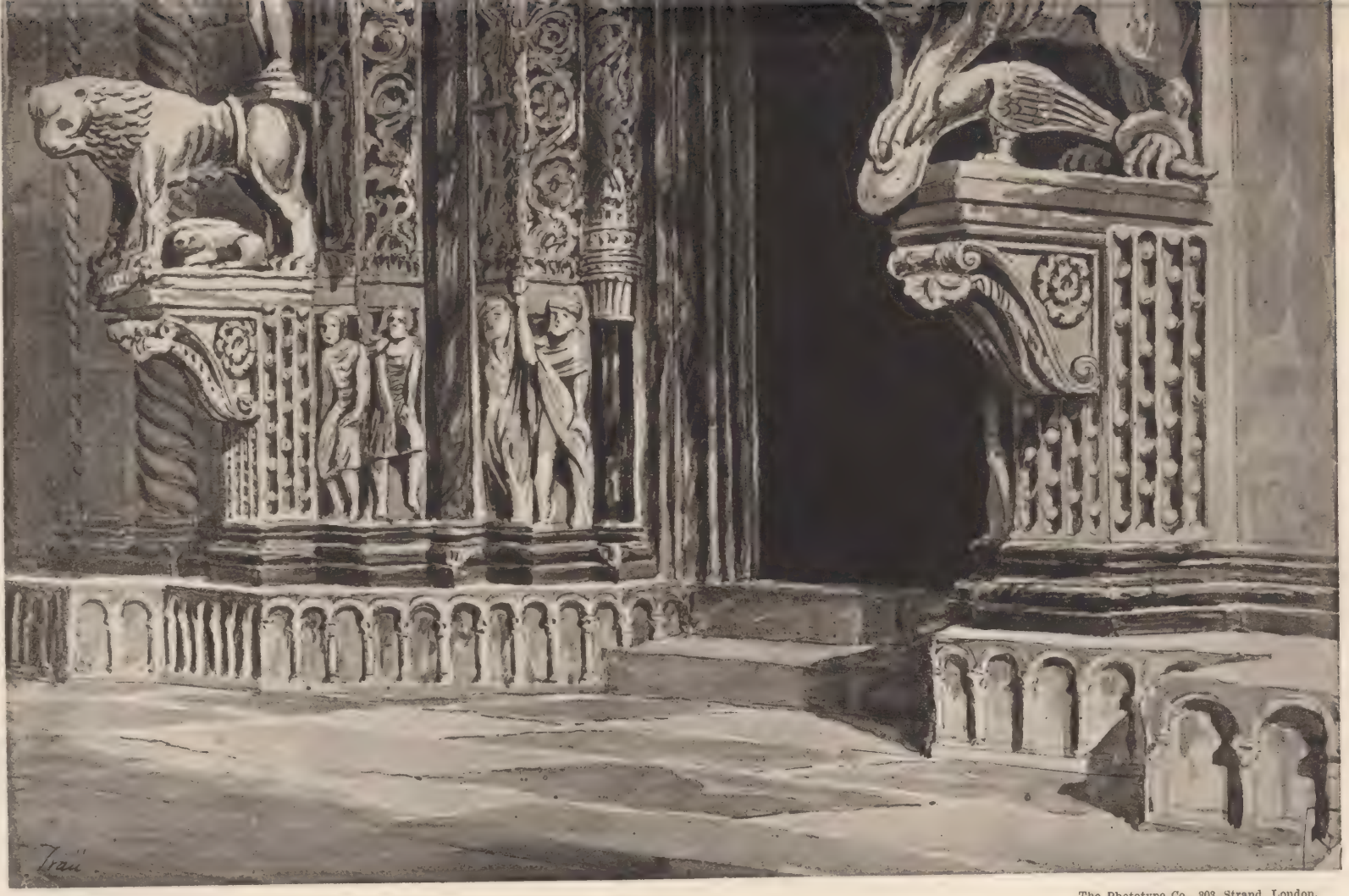
The finest church of the thirteenth century in Dalmatia is the duomo of Traü which was begun shortly after 1200, and carried on with interruptions till 1698, which is the date of the completion of the spire. The body of the church, however, was practically completed and the style fixed by 1251. It consists of a nave and aisles ending in basilican fashion with three apses, and preceded at the west end by a magnificent Galilee porch or narthex, which was to have been surmounted by two towers, though only one of them is finished. The east end illustrates more perhaps than any other building in Dalmatia the influence of the political connection of the country with Hungary upon its architecture; the resemblance between it and the east end of the contemporary church of Jàk in Hungary, with their three round apses surmounted by a lofty gabled wall, raised so much as to give space for a wheel window, their flat exterior buttresses, billet mouldings, sunk dentils, arched cornices, and half columns applied to the exterior of the apses, is too striking to fail to carry conviction.[81]

The west doorway of Traü is the crowning glory of Dalmatian architecture. For richness of detail and marvellous finish of execution, combined with a certain restraint and simplicity of design which speaks highly for the artistic qualifications of the designer, this magnificent portal may challenge comparison with any work of Romanesque or Gothic architecture. Seen by the tempered light of the splendid porch which overshadows it, it forms a picture which no traveller who has seen it will ever forget [Illustn. xl.]. Though built in 1240 it is thoroughly Romanesque in character, but in respect of the refinement of its execution, and the style of its figure sculpture, it is fully equal to the most advanced examples of Gothic work. It consists of a square-headed doorway between recessed and shafted jambs, surmounted by a round arch of several orders enclosing a tympanum filled with a sculpture of the Nativity. Statues of Adam and Eve resting on a lion and a lioness flank the doorway, and though the human figures, like all mediæval attempts at the nude, are failures, they are redeemed by the magnificent design and expression of the animals that support them. Nothing can be more exquisite than the finish of the scroll work, intermixed with little figures and animals, with which the

[81] To illustrate this point Mr. Jackson showed drawings, side by side, of the east ends of the two churches.

XXXV. THE ARCHITECTURE OF DALMATIA (xl).





T.G.J. del.

The Phototype Co., 303, Strand, London.

TRAÜ

West Doorway of the Duomo.

[PAGE 172.]

jambs and their columns are enriched; though boldly designed and broadly treated they have all the finish of ivory carving.

To the thirteenth century and the earlier part of it belong the wooden doors, the choir stalls, and the magnificent marble pulpit, of the Cathedral of Spalato, once the temple of Diocletian's palace. The doors were made in 1214 by Messer Andrea Guvina, painter of Spalato, and are therefore among the earliest specimens of mediæval woodwork in existence; they consist of two flaps, with twenty-eight panels containing sculptured scenes from the Life and Passion of our Lord, surrounded by wreaths of Romanesque scroll work, which are full of delightful fancy and variety. The carving was originally gilt upon a red ground. The choir stalls belong to the same period, and might be by the same hand, and they are remarkable for their curious lattice-work panels, which are almost identical with the window screens of Cairo, and have a most un-European look. The pulpit is in the same style, and no doubt coeval with the stalls and doors, and is full of good design, and finished with technical skill of the highest order. Like the other work of this date, it is thoroughly Romanesque in character.

The greatest work of Dalmatian architecture in the fourteenth century is the Campanile of Spalato, of which I was able to make a measured drawing with some details. The exact date of this magnificent tower has still to be ascertained, but there is little doubt that it was begun about the year 1300 by Maria of Hungary, wife of Charles II. of Naples. After her death in 1323 the work was interrupted, the two lower stages only having then been completed. It was resumed about 1360, after the conquest of Dalmatia by Lewis the Great of Hungary; the architect being one Nicholas Tverdoj of Spalato, from whose design the tower, with the exception of the octagonal lantern, was finished in 1416. The tower occupies the place of the portico of Diocletian's temple, now the Duomo; and such was the confidence of the mediæval architects in the stability of Roman work that they based their tower, without any other preparation, on the podium and staircase of the Roman portico. The lowest storey is pierced by a vaulted archway leading to the Duomo behind, and the piers on each side of this passage consist partly of detached columns, and partly of solid masonry, which is however hollowed out for two ramping staircases. Consequently it is no wonder that the lower storey shows signs of crushing, and that it has been found necessary to encase the tower with scaffolding as a preliminary to rebuilding it.

The whole tower in all its parts, whether early or late, bears the stamp of the Romanesque style, and abounds in details borrowed from the late Roman work of the third century, by which it is surrounded. No stronger instance exists of the firm hold which the earlier round-arched styles maintained on Dalmatian architecture to the end of the middle ages, nor of the strong influence of Diocletian's building on the imagination of Dalmatian architects.

Among other examples of the fourteenth century are the cloisters of the Dominican and Franciscan convents at Ragusa. The latter was built by an Albanian architect, Mycha di Antivari, in the first half of the century, and is Romanesque in style, though full of queer fanciful sculpture, which gives it a very original air, and renders it one of the

most singular pieces of architecture I have ever seen. The Dominican cloister is a little later, and though round-arched is Gothic of a kind, but full of queer irregularities and solecisms. I may here notice that it is in the buildings of the mendicant orders that I observed the earliest appearance of the Gothic style in Dalmatia.

At the beginning of the fifteenth century Dalmatia passed finally under Venetian dominion, and the political change is marked by a corresponding transition in the architecture of the province. Romanesque architecture now finally melted away, and was replaced by the Gothic of the mistress city. The latest round-arched work in Dalmatia is probably in the upper parts of the fronts of the Duomo and S. Grisogono at Zara, which seem to me posterior to the rest. They date from about 1400—1409, by which time the classic Renaissance had made its appearance in Italy; and thus the ancient round-arched work of Dalmatia actually meets the new round-arched work of Brunelleschi.

Venice did not adopt the Renaissance so soon as Central Italy, and the style she brought with her into Dalmatia was Gothic, of that special kind which, in domestic work, more perhaps than in ecclesiastical, is inseparably associated with the City of the lagunes. In every Dalmatian town, on mainland or island, one sees at every turn the same semi-Oriental ogee windows, and the same graceful balconies, that one knows so well on the canals of Venice; the churches are fitted with magnificent stalls of Venetian woodwork, and the treasuries filled with plate, the work of Venetian silversmiths.

Gothic architecture, however, never took a firm hold on the country except in domestic work. There is but one great church, the Duomo of Sebenico, in that style; and of that church only the lower part of the nave and aisles is Gothic, the rest being finished by a Renaissance architect. The Gothic part was built between 1430 and 1441 by Messer Antonio di Pietro Paolo, a Venetian, and is an excellent specimen of Italian Gothic architecture at its best. The sculpture is bold and effective, and the details are refined, but for some reason or other its design failed to satisfy the Sebenzani, who dismissed their architect and called in another, of whom I shall have more to say, as he played a conspicuous part in the history of Dalmatian art.

While speaking of the Gothic buildings of Dalmatia I must not forget the interesting little cathedral of the island of Curzola, with its pointed arches and graceful west front and campanile; nor the not less interesting Sponza or custom-house of Ragusa, which in the interior somewhat resembles it. But the most important and the most beautiful Gothic work in Dalmatia is to be found in the palace of the Rector of the little Republic of Ragusa, which, on the retirement of Hungary from Dalmatia instead of falling like the rest of the country into the power of Venice, succeeded in establishing an independence, which, under the protection of Hungary and afterwards of the Empire, it maintained till suppressed by the arbitrary whim of Napoleon in 1808.

The palace was begun in 1435 by Messer Onofrio Giordani di La Cava, a Neapolitan, and though it has been a great deal altered in subsequent times it still retains much of his work. The front had originally a low tower at each end, between which was on the

ground floor an open loggia of six arches supported by monolithic columns from the island of Curzola, and capitals sculptured with an artistic touch of which it is difficult to speak too highly. There is extant an account of this palace by a schoolmaster of Ragusa, who saw the capitals in the sculptor's hands, and who writes as follows:—[82]

"*There are five large entire columns, but two other half columns, one attached to one "tower the other to the other; on the first was carved Aesculapius the restorer of the medical "art, at the instigation of that remarkable poet and most learned man of letters Nicolò di "Lazina, a noble of Cremona, a man beyond doubt of great weight, and among the learned "approved for his worthy deserts, who, in order to retire a little from the dissensions of his "country, undertook to exercise and bear the burden of the chancellorship of Ragusa, and is "now bearing it. For he, since he knew and had learned in his literary studies that "Aesculapius had his origin at Epidaurus, which is now called Ragusa, took the greatest "pains and trouble that his image should be carved on the building, and he composed a "metrical epitaph to him, which was fixed in the wall. On a certain column of the "entrance of the palace is seen sculptured the first righteous judgment of Solomon; in a "certain angle of the principal door is the likeness of the Rector hearing offences. At the "entrance of the Lesser Council, of which I shall have to speak by-and-bye, is a certain "sculpture of Justice holding a brief, on which is read as follows:—Jussi summa mei sua "vos cuicumque tueri.*"

These sculptures remain to the present day, though not all in their original position. The capital with Aesculapius is still where Diversi saw it, with its metrical "*epitaph*" in the wall beside it. The sage sits in the midst of his phials, retorts, and crucibles, while his servant receives a countryman who comes for advice, bringing the appropriate present of a cock. The figure of Justice, guarded by two lions and holding her "*brief*," still presides over the door of the lesser council, and hard by is the Rector of the Republic wearing the coif of a Doctor of Laws and judging offences. But the capital of the first righteous judgment of Solomon lies two miles off in a garden at Gravosa, where it was, I think, first noticed by Mr. Arthur Evans. I believe I have succeeded in ascertaining its original position in the palace, and in proving that it once formed one of the capitals of the loggia itself, three of the present series being in my opinion interlopers, inserted at the same time as the round arches of Renaissance work which have replaced the original, arches of Onofrio di La Cava's design. These original arches were in all probability pointed, like the great doorway of the palace and all the windows by Onofrio's hand.

The whole of the sculpture by this artist is of a very high order: the figures are admirably modelled and full of character, and the foliage has an exquisite delicacy of finish, combined with a proper architectonic expression of strength and support, that has hardly been surpassed in the school of Gothic sculpture.

But the reign of the Gothic style in Dalmatia was a short one. It was adopted very late and abandoned very early for the Renaissance, a style for which the Dalmatians

[82] "Situs ædificiorum Politiæ et laudabilium consuetudinum inclytæ civitatis Ragusii," by Filippo de Diversi de Quartigiani of Lucca. It was published at Zara, 1882, Ed. Brunelli, but I cite from a MS. in the library of the Franciscan Convent at Ragusa, which is more complete.—T. G. J.

showed an almost precocious aptitude. The great apostle of the new movement in Dalmatia was Giorgio Orsini, a native of Zara, descended from the old princely Roman house, though the branch to which he belonged had come down in the world, and been forced to support itself by manual arts, inconsistent with the idea of nobility as then understood. Giorgio is supposed to have studied his art at Venice, where he married and where he owned property. In 1441 he was invited to Sebenico to replace Messer Antonio di Pietro Paolo, who had fallen into disrepute with the building committee of the cathedral. Giorgio arrived with the first movements of the coming Renaissance already at work in his brain, and throwing over the Gothic plans of his predecessor, began the choir and superstructure of the cathedral in the new manner. His work is curiously eclectic, combining with the columns and entablatures of classic, the window traceries of Gothic work; but as he went on the Gothic element dropped out more and more till his style approached that of the Lombardi at Venice. When it is remembered that his work at Sebenico preceded that of Leo Battista Alberti at Rimini by nine years, and the Chiesa dei Miracoli by Pietro Lombardo at Venice by forty years, while in France, England, and Germany the Renaissance did not set in till from seventy to a hundred years later, it will be admitted that Giorgio Orsini is entitled to a foremost place among the promoters of the great artistic revolution of the fifteenth century.

The cathedral of Sebenico, though not large, is one of the most impressive churches of Christendom, and is certainly one of the most singular in its construction, which is daring almost to the point of audacity. The whole building is roofed with waggon vaults, made of huge slabs of marble supported on strong transverse ribs, the same stone covering forming the ceiling inside and the roof outside. Here, again, we may perhaps trace the influence of Diocletian's work at Spalato, and see in the waggon roofs at Sebenico a version of the waggon vault of the temple of Aesculapius. But at Sebenico the scale is so great, the height at which the roofs are fixed so considerable, and the thickness of the walls and supports so slender in comparison with the Roman work, that the design may fairly claim to be considered original, and deserves all the surprise and admiration it is sure to excite in the mind even of the most unobservant.

The new style was no sooner established in Dalmatia than it displaced the Gothic style for all buildings of importance, though in domestic work and humbler buildings Venetian Gothic still held its own. But in their practice of Renaissance architecture the Dalmatians still showed their old originality, and used it with a freedom that had more of the spirit of the older Gothic art than of that slavish obedience to formula which the severer masters of the classic Renaissance exacted. The Dalmatian Renaissance work is eclectic from first and last: pointed arches and trefoil-cusps are to be found combined with fluted pilasters and shell-headed niches; and classic entablatures of architrave, frieze, and cornice surmount arcades that might have been constructed in the fourteenth century. It is this freedom of style and absence of conventional restraint that makes the architecture of Dalmatia so interesting and, I may add so instructive, a study to us architects of an age which, from its conditions, must of necessity be eclectic. However strangely mixed the elements of the designs may be, they are happily combined with a true artistic

instinct, and, though regarded separately they might appear incongruous, taken together they produce a consistent and harmonious whole, which owes perhaps not a little of the effect it produces to the piquant assemblage in unexpected agreement of elements that might have been expected to disagree.

Contemporary with Giorgio Orsini, or Giorgio Dalmatico as he calls himself, and as his admiring countrymen like to know him, was another Dalmatian architect of fame. In 1468 Federigo di Montefeltro, Count of Urbino and Castel Durante, and Captain-General of the League, set about building that palace at Urbino which is one of the gems of Renaissance art. "*Having*," as he says, "*searched everywhere, and especially in Tuscany, "where is the fountain of architects, without finding a man truly intelligent and well skilled "in that craft*," he finally selected Messer Lutiano of Laurana or Vrana, in the territory of Zara in Dalmatia, whom he employed to build his palace, and whose work we can still distinguish from that of Baccio Pintelli, who took up the work on his death. There is not, so far as I know, any building by Luciano in his native country; he settled at Urbino, and died at Pesaro about 1481.

Another architect of the same period, whose works resemble very closely those of Giorgio Orsini, was Andrea Alecxi, or Alessio, an Albanian of Durazzo. He was employed largely at Spalato and Arbe, and above all at Traü, where he built the baptistery and the sumptuous chapel of S. Giovanni Orsini, the patron saint of the city.

The Renaissance art in Dalmatia continued as it had begun, free from the shackles of a rigid formalism. It never developed as it did in Italy into pure Palladianism. Of the cold severe architecture of that school there is hardly an example to be found throughout the province; something of the wild freedom and playfulness of Gothic clung to it from first to last, till in the latter part of the seventeenth century it suddenly sank into the slough of the "Barocco," in which all its life and beauty was at once smothered, and architecture as a fine art ceased to exist.

This review of Dalmatian architecture is necessarily only a sketch, but I hope I may have interested the Institute in the characteristics of a school of mediæval art of the existence of which, perhaps, none but the few who have been in the country have hitherto had any conception. The Roman remains of Dalmatia and Istria have been well described and illustrated, but the monuments of mediæval art which those countries contain have been overlooked. I hope to have shown that they merit a better fate, and that Dalmatian art deserves a chapter to itself in the history of the mediæval styles of Europe. There, as is in other countries, architecture took certain peculiar forms, and put on certain distinctive characteristics, the result of national temperament or political accident, which serve to make it a national style, like and yet unlike the coeval styles of other countries. For though the Dalmatians followed the example of other countries, they were not mere slavish copyists, and they may fairly claim to be original in much they did. Their long and faithful adherence to Romanesque architecture gives a very distinct character to their work, for while clinging to the simple round-arched forms which other lands had given up, they continued to advance in technical skill, and consequently their

later Romanesque work is marked by a delicacy and refinement of execution which contrasts strongly with the ruder Romanesque of France and England. The savour of northern Gothic also which hangs about much of their architecture, and which I have accounted for by the influence of the Hungarian rule, is another peculiarity which distinguishes the architecture of Dalmatia from that of other countries situated in the same latitude, and one which, perhaps, adds to its charm in the eyes of students from beyond the Alps. Another element of interest on which I have dwelt is the effect on Dalmatian art and architects from first to last of the buildings of Diocletian's palace at Spalato, which inspired the forms of their doorways, the plans of their churches, the style of their decoration; and was no doubt one main cause of the fidelity with which they clung to a round-arched style till the end of the fourteenth century, and the strange and almost precocious ardour with which they welcomed the return of the round arch when the Renaissance brought it about, and the readiness with which they abandoned the pointed forms of Gothic, and put those of the new style in their place.

I would willingly, had time permitted, have said something of the rich stores of silversmiths' work, and the magnificent embroideries which the treasuries of the churches contain. I may mention, in particular, the grand silver ark which holds what professes to be the body of St. Simeon at Zara; also the silver statuette of S. Biagio at Ragusa which is interesting from the model of the city in the hand of the figure, where may be seen several buildings which perished in the great earthquake of 1667; a large silver pala in the duomo of the little-known island of Veglia, in the Quarnero; the very curious pastoral staff of Archbishop Valaresso at Zara, dated 1460; and the somewhat similar one of brass and base metal of Bishop Patrizio on the Island of Lesina, which dates from 1509. Some church plate which I saw in a Greek convent in Herzegovina is interesting as an example of the unprogressiveness of Byzantine art, and of the backwardness of the Slavonic districts in comparison with the Latins of the maritime cities. Though in a great measure differing little from the Byzantine designs of the ninth or tenth century, I was able to ascertain that these examples date only from about 1640. A great deal of the silversmiths' work in the province is by Italian artists, but much of it was undoubtedly produced by native Dalmatians, and one beautiful chalice of very original design in the island of Mezzo, bears the hall-mark of Ragusa, and is the work of one of the goldsmiths for whom that island, which was subject to the little Republic of S. Biagio, was famous.

T. G. JACKSON.

XXXVI.

SKETCHES IN SHROPSHIRE AND WORCESTERSHIRE.

By Mr. H. D. Walton, *Pugin Travelling Student*, 1886.

[*Extracted from a Report addressed to the Council of the Institute.*]

THE Feathers Inn, Ludlow, is a quaint half timber house of the time of James the First. It has two splendid rooms, oak-panelled to the ceiling, and richly carved chimney-pieces. The ceiling of the larger room is of plaster. It is divided into three compartments, separated by ornamented beams, the wall cornice returning round each beam. The central bay is plain, with a large centre-flower ornament; while the two end compartments are covered with the rib and foliage work shown on the measured drawing [Illustn. xli.]. The two bay windows also have flat ceilings, each filled with a complete foliated design.

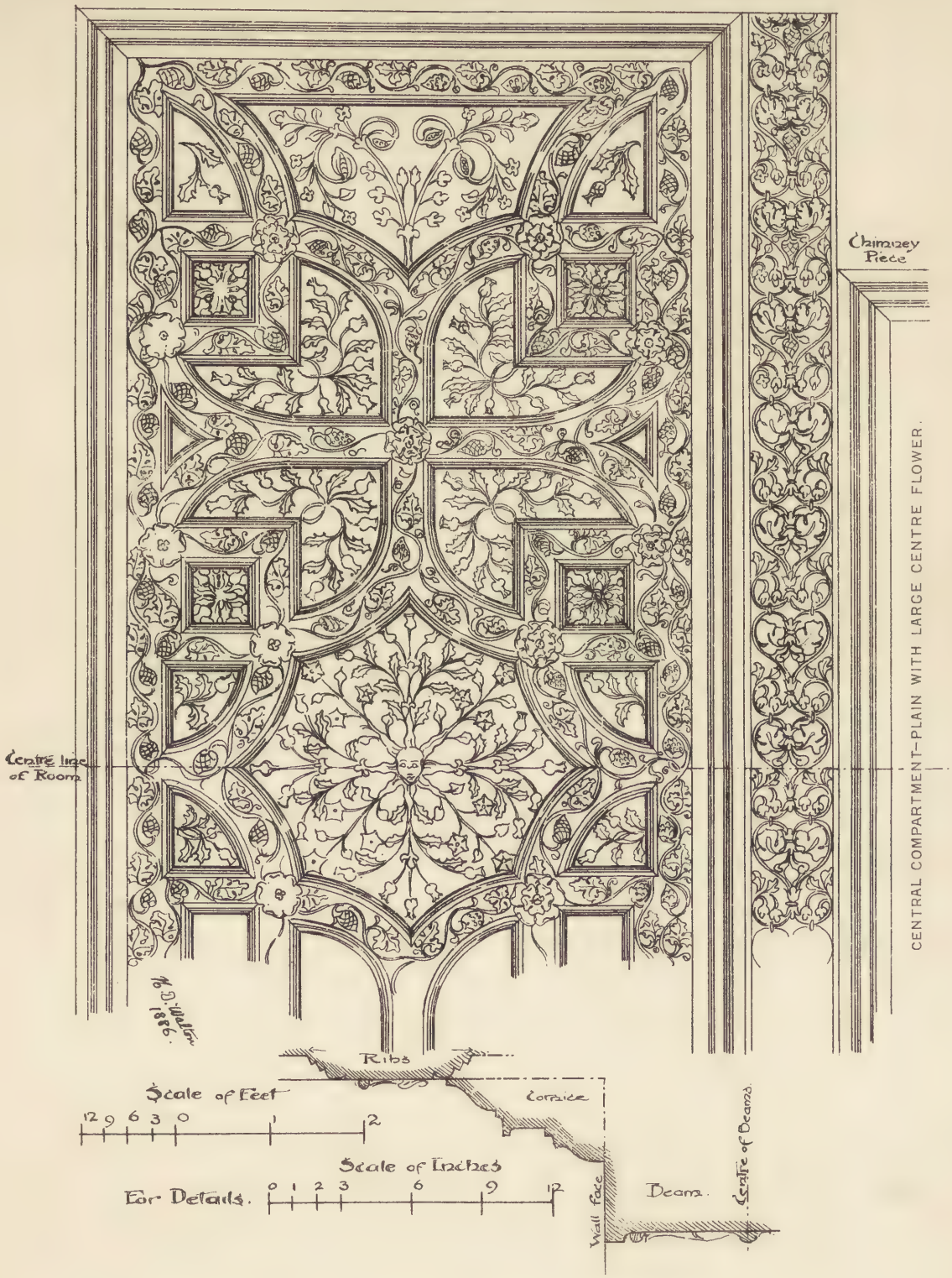
At Evesham, near the remains of the former great abbey, there is a very picturesque group of ecclesiastical buildings, composed of the great bell-tower of the abbey and the two parish churches of All Saints and St. Lawrence, each with a western tower and spire. The tower of All Saints, which, with its jutting-out corner pinnacles and projecting cannon-shaped gargoyles, is remarkably Scotch in character, together with some other portions of the same church, is of early date; but the bulk of the buildings in the group has been completed in the 15th century, and the detail throughout is very similar. On the wall-spaces there is a prevalence of perpendicular rib and panel work, very like in style to that used on the Houses of Parliament; and in this connection, it is interesting to know that Pugin studied here. An illustration is given of one of the best portions, the western porch of All Saints. It projects in front of the tower, and is built of the pink and yellow sandstone of the district. The plans and elevations [Illustn. xlii.] explain themselves; but it was not thought necessary to show a section, as the ceiling is flat, plastered, with moulded oak cornices and cross ribs, as shown on the plan. In the centre is a large oak boss, curiously carved to represent a crown of thorns and the wounded heart, hands and feet of Christ. This composition is called "The Five Wounds." On the same sheet a drawing

[Illustn. xlii.] is given of the central part of the stone reredos in St. Lawrence's Church, Ludlow. This reredos, consisting, above the level of the altar table, of two storeys of elaborately canopied niches, filled with figures and finished with a crested cornice, was wonderfully preserved from destruction during the Civil Wars and the Puritan times by a sham wood-panelled screen built in front of it. When more peaceful times came the screen was removed and the old work found quite intact.

Another drawing [Illustn. xlii.] shows a part of one of the side screens in the chancel of Great Malvern Priory Church. From the fact of there being no proper chancel arch here, and that in the neighbouring church of Little Malvern there is a roodscreen of very similar design, I think that these side screens originally formed one, which was placed across the entrance to the chancel of the Priory Church. The carving is very delicate in execution. A description of the whole church, which is late Perpendicular, and has a rich store of stained glass, is given in my MS. journal in the library; and a sketch of the exterior has been published in the Association Sketch-Book.

H. D. WALTON.

XXXVI. SKETCHES IN SHROPSHIRE AND WORCESTERSHIRE (xli).

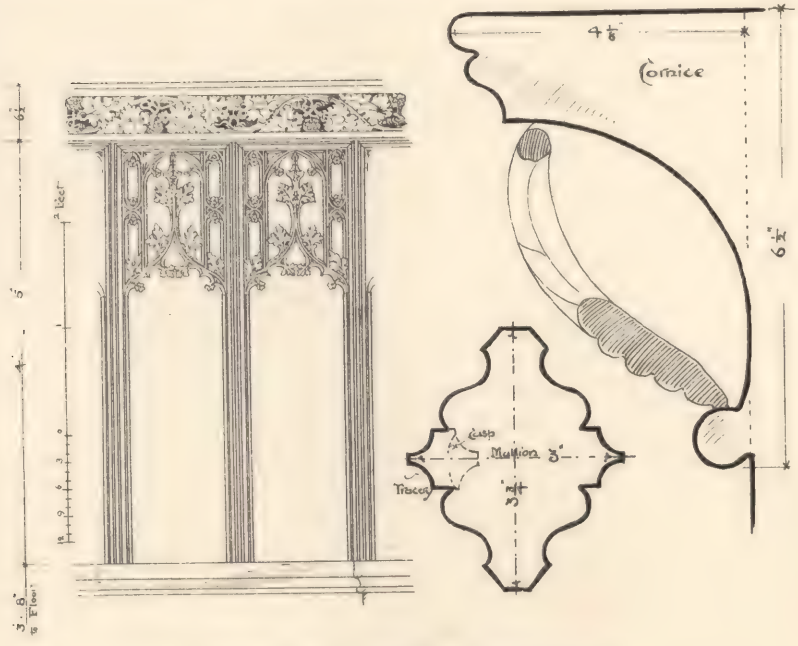


A CEILING AT THE FEATHERS INN, LUDLOW.

XXXVI. SKETCHES IN SHROPS

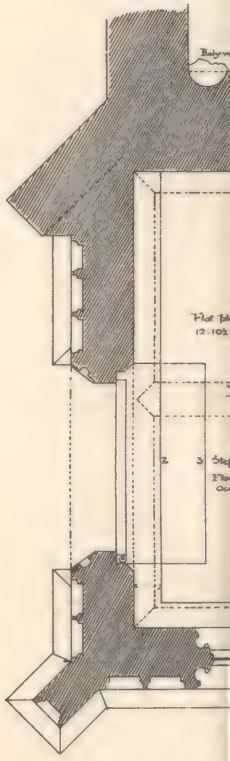


CENTRAL PART OF STONE REREDOS, LUDLOW CHURCH.



PART OF A WOOD SCREEN
IN THE CHANCEL OF MALVERN PRIORY CHURCH.

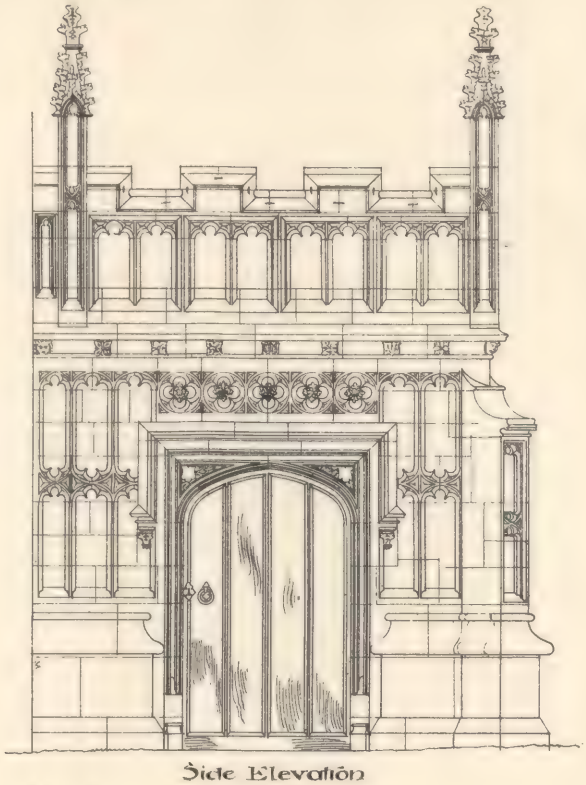




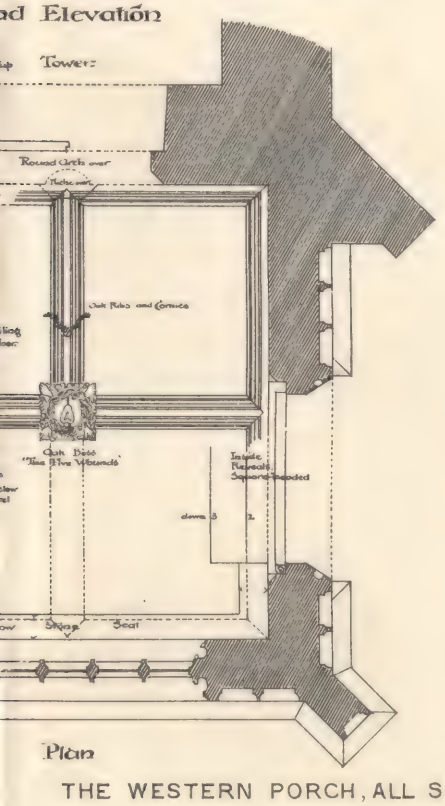
RE AND WORCESTERSHIRE (xlii).



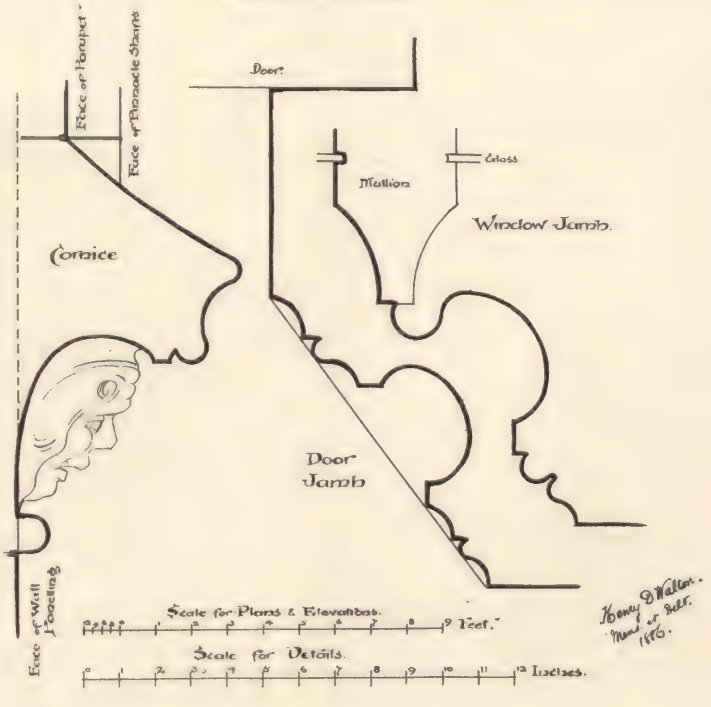
ad Elevation



Side Elevation



Plan



THE WESTERN PORCH, ALL SAINTS CHURCH, EVESHAM.

XXXVII.

A JAPANESE GENTLEMAN'S HOUSE AT TOKIO.

By Roger T. Conder, *Associate.*

A GENTLEMAN'S house in Tokio was casually mentioned by my brother in his recent Paper;[83] and I am now enabled to give further particulars of it, with the plan [Illustn. xliii.] of the house. The arrangement of the rooms round the internal court or garden ensures through light and ventilation to the whole house, and at the same time cheerful views are obtained from the rooms of the gardens and landscape beyond. The six principal rooms have no distinct functions, and if named at all would be named according to the number of mats, or the subject of decoration employed. The large 15-mat room is essentially the reception room, but the master of the house would probably use it as his bedroom in the summer, as being the most airy room in the house. The kitchen, bath room, and privies are so placed, that whilst access to them is easy they are well ventilated, and away from the principal living rooms. This plan shows a very ordinary arrangement where the owner of the house is not cramped for room, and is able to surround his house with an attractive garden. But in the large towns where land is more valuable, such a house would often be more compactly planned,[84] and the internal

[83] See Mr. Josiah Conder's Paper in the present volume, page 108 *ante*, and Illustns. xxix., xxx.

[84] It is matter for surprise that in Japan, in spite of the constant and destructive fires that occur there and spread devastation all around, no precautions should have been taken to protect buildings from this dread enemy. The *kura*, or fire-proof stores, strongly built of stout wooden posts and beams, and coated with thick layers of mud on the outside, are the only attempts in this direction. The fact can hardly be altogether satisfactorily explained by the comparative costliness and slowness of such a method of building—for in some cases questions of time and cost are very secondary considerations. The chief reason is more probably to be found in the past immovable Oriental conservatism of the Japanese, and the hereditary transmission of trades, which were handed down from father to son, from generation to generation, and jealously guarded from outsiders. These causes, and the arbitrary feudal laws regulating the sizes and design of the buildings of military chieftains and their vassals, forbade a Japanese builder from launching out into new experiments, or attempting to improve upon the work of his predecessors. The chief obstacle now, to the widespread use of modern methods of building in brick and stone, is the comparative costliness of such erections, but it would be quite possible, whilst still building as heretofore almost entirely in wood, to take certain precautions which would at least prevent the spread of a fire beyond the immediate neighbourhood where it originated. In

garden would be dispensed with. In that case the building is generally oblong on plan, with kitchen, bath room, &c., either at one end of the block or at the rear, behind the principal living rooms. Increased accommodation is often gained by means of a first floor consisting of one or two rooms, and even sometimes of an additional or second floor.



Back Elevation of a House of Two Storeys.

This is, however, unusual, and is seldom found in private houses, except in the case of the large summer pavilions of the princes. A model of one of these summer pavilions was brought to England by my brother, and is now in the Queen's Park Museum, Manchester. These pavilions and the military palaces have been described at some length in my brother's Paper, and it will be seen that they differ in general arrangement from the ordinary plan of a gentleman's house, first in the provision of certain ceremonial reception rooms, with floors slightly raised above the surrounding vestibule; secondly, in the greater delicacy and richness of the joinery finishing and decoration. The verandahs are often wider, and provided with a hand-rail, occasionally filled in with ornamental cusped forms or pierced panels. The pavilions of the nobility and the palaces are decorated with elaborate mural paintings, and with coffered ceilings,

a crowded city like Tokio, when a fire is once started during the prevalence of a strong north wind it not infrequently forces its way in a straight line, spreading laterally on the way, right through the city; and the only way to stop it is to pull down a number of houses to leeward of the coming devastation. It would have been possible, and would still be possible where not already enforced by law, to compel the coating over of much of the exposed wood-work of roofs, verandahs, &c., with mud and plaster, and to prohibit entirely the use of thatch and of wood shingles on roofs. Kitchen ranges might be set in mud or tile and plaster or brick-work, in an external wall; and other simple and inexpensive precautions might be taken which would lessen the danger of fire. If, in addition, the rather more costly expedient were adopted of enforcing the construction of a party-wall of mud between each dwelling, or now that bricks are being made, of brick-work, the public safety would be much enhanced; and the existing mode of construction might be retained until gradually replaced by the erection of more solid buildings. Such party-walls should, in my opinion, extend in front of the buildings sufficiently far to shield the verandahs and overhanging roofs of a house from the adjoining premises, and should, necessarily, be taken up a certain distance above the lines of the roof.—R. T. C.

often gorgeously decorated. In the ordinary house of a gentleman the slides are often decorated also, but the ceilings are generally plain, and as a rule a very quiet taste is displayed in the finishing of the interiors of dwelling houses.

Where a handsome and striking effect is aimed at, the result is generally obtained by elaborate and minute joinery, in which different coloured woods often inlaid with patterns or designs are used. The *tokonoma* and the shelved recesses are delicate pieces of cabinetmaker's work, set off and embellished with beautifully ornamented metal fittings. In the ceilings, panels of different coloured woods, such as cedar, red pine, elm, bamboo, &c., are used. Where wood showing a handsome grain is used in short lengths, the planks are put together on the building, with the ends in the same relative position to each other as they occupied in the block of wood from which they were cut. The junctions of the different planks are hidden by cross ribs, and the effect of one piece of timber with a continuous grain from end to end is obtained.

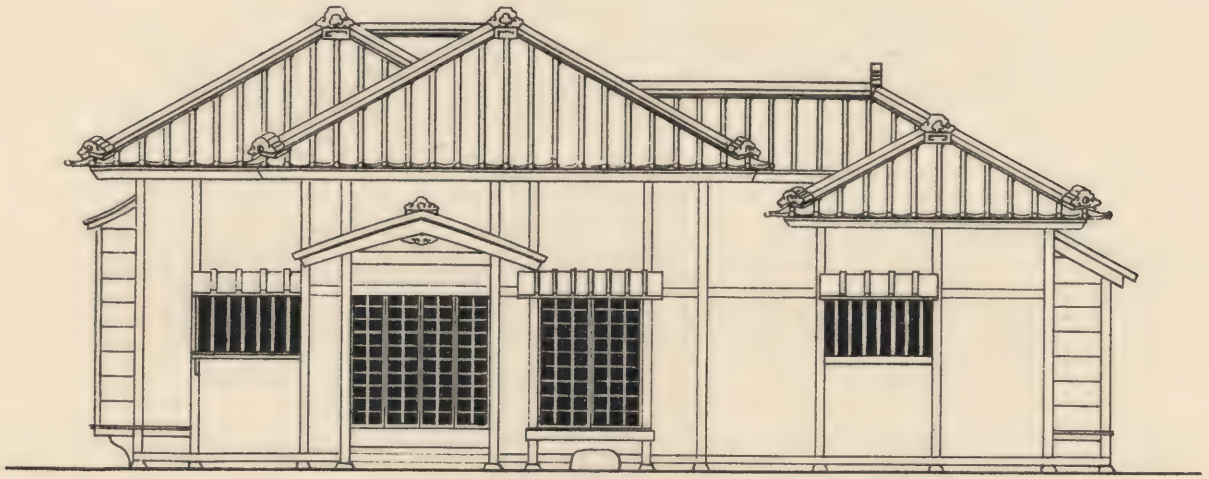
In this house [Illustn. xliii.] the *tokonoma* of the large 15-mat room has two ornamental polished corner-posts, with a horizontal cross piece about 2 feet below the ceiling supporting a plastered frieze, somewhat shallower than the frieze or upper panels of the room. The junction of the beam and post is secured with a large ornamental headed nail of a geometrical pattern. The recess has a boarded ceiling, and the back and side walls are stuccoed. The floor supports a vase of flowers or some other ornament, and upon the back wall a triplet of roll pictures is hung. Where walls are stuccoed, a rough tinted surface is generally preferred to a smooth white surface, or to a wall paper. These tints are produced by mixing coloured earths, sand, or powdered stone, with the lime. Such stuccoing does not cover the chief constructional posts and beams, but finishes an inch behind their faces, which appear as a part of the decoration of the room. In these internal timbers, therefore, as well as in the boarded ceilings great care is given to the cleanliness and continuous grain of the wood used. In the better-class houses no knots whatever are allowed. The woods most used are a clean white pine called *hinoki*, and a prettily grained red cedar called *sugi*. For the posts of the *tokonoma*, which are exposed on all three sides, and for the shelves, fancy pieces of rare wood are often used. In the little tea-houses most quaint and fantastic forms are given to these openings, and the quiet taste in decoration is carried to the verge of austerity. The frieze portion over the *tokonoma*, and also those over the slides communicating between room and room, which are called *ramma*, are filled in with woodwork, taking the form of either a thin plank pierced with some geometrical or free design or of some ornamental trellis-work. Such patterns are also freely used in the *shoji*, or outside slides. The different designs used, which are very numerous, are almost a study in themselves, and the delicacy and neatness of the work are admirable. The paper is secured to the outside of these frames, so that the light enters the room through the spaces of the lattice-work, which stands out as a dark pattern against the light. The *fusuma*, or slides dividing room from room, are papered on both sides with a thick opaque paper. Their place is sometimes taken by screens made of rushes secured to a wooden frame, through which the summer breezes may blow without

hindrance, whilst privacy is secured to the apartment fenced off. The fittings attached to the slides for convenience in pushing them open or close do not, like our door handles, project from the face of the frame, but are sunk into it, a portion only being flush with the outside of the frame. They are of wonderful variety in shape and design, geometrical forms predominating, and are made of copper, iron, and many different alloys, and are often beautifully carved and inlaid or enamelled.

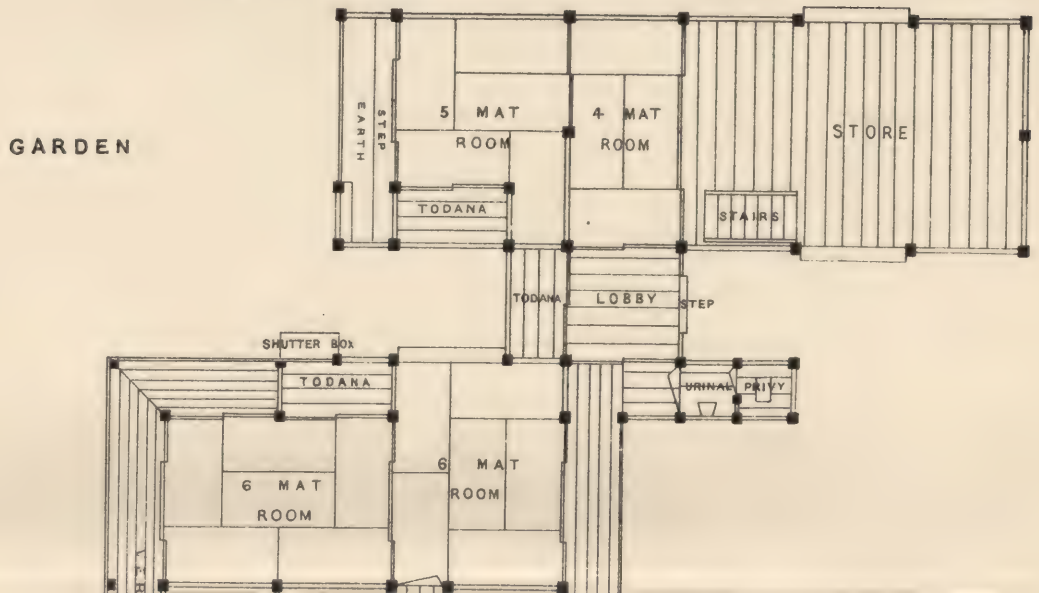
The arrangement of fire, sinks, bath, &c. in the offices is of a primitive character. The kitchen range is usually unprovided with any flue for conducting the smoke outside the building. Recently iron hoods have often been placed over ranges, from which an iron pipe conducts the smoke to the outside of the building. The ranges are sometimes built of stone, but oftener of tiles and mud plastered over, sometimes supported on a wooden framing, sometimes resting directly on the floor. Two or three openings for fuel are provided. In addition, small stone ranges are used solely for the purpose of boiling water. A portion of the kitchen floor is invariably constructed sloping from two sides inwards towards a drain in the centre. In this portion, which corresponds to our scullery, the washing of vegetables, dishes, &c. is performed. If there be no well in the kitchen a tub is provided here, which is kept replenished with fresh water. A small supply of charcoal and wood is usually kept in the kitchen. For this purpose some of the boards of the floor are made to lift up, when a convenient store is discovered under the floor. The bath is usually merely a tub, with an opening at the side into which a metal fire-box is inserted. Sometimes this box with a portion of the bath itself is on the outside of the room, and the two portions of the bath are connected by means of tubes of bamboo or metal. In the house illustrated the bath furnace is outside the building, an arrangement usually followed in the best class of houses.

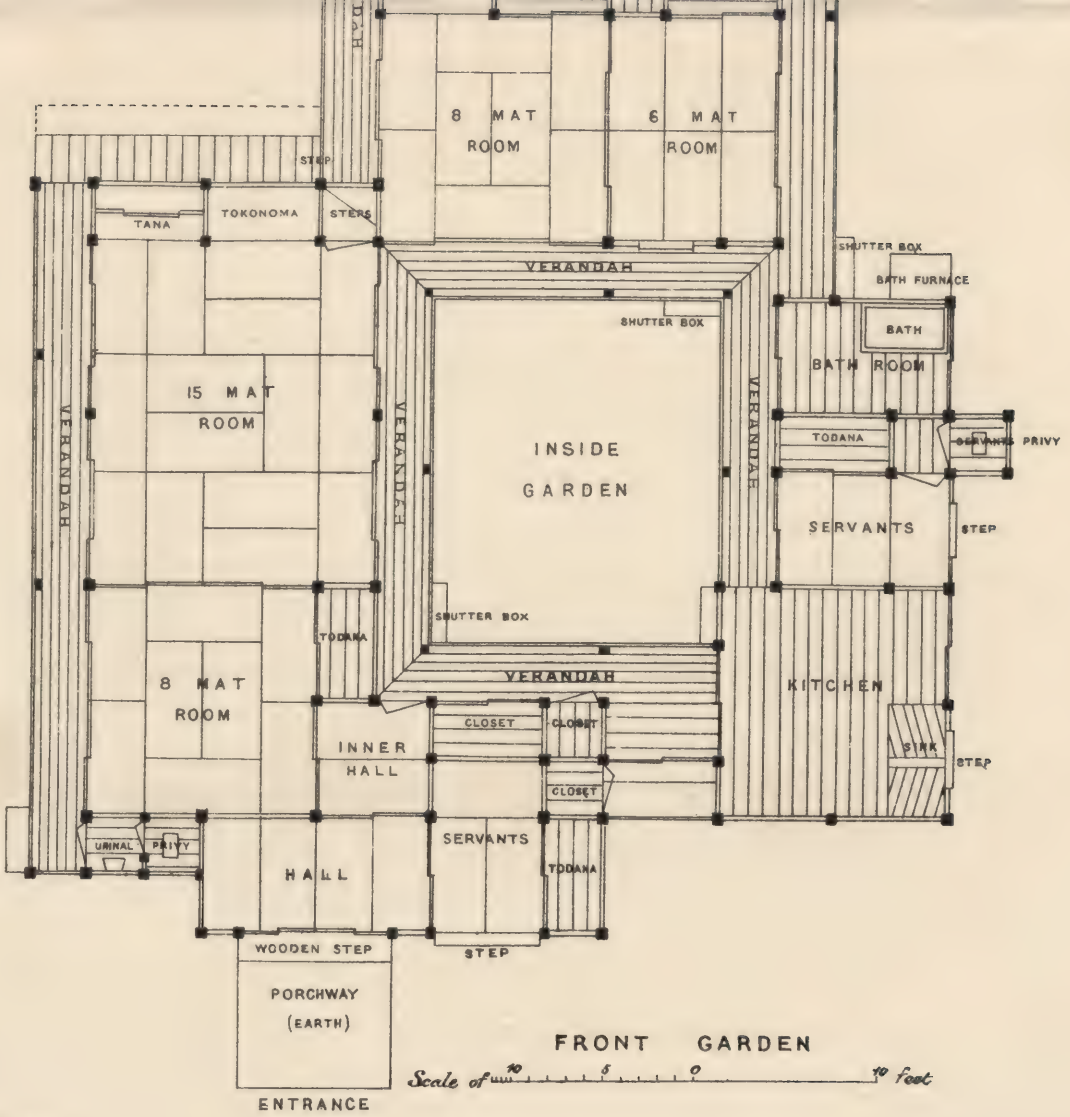
ROGER T. CONDER.

XXXVII. A JAPANESE GENTLEMAN'S HOUSE AT TOKIO (xliii.)



FRONT ELEVATION.





R.T.C. del.

PLAN.

[See Pages 108 &181.]

C. F. KELL PHOTO-LITHO 8 FURNIVAL ST HOLBORN, E.C.

XXXVIII.

NOTES ON THE SUPERINTENDENTS OF ENGLISH BUILDINGS IN THE MIDDLE AGES.[85] By WYATT PAPWORTH, *Fellow.*

SINCE the time of Walpole and Dallaway, little has been done to compile any notices of the early practitioners of our art, or to ascertain who were really the persons entitled to the credit of designing the works erected in England during the Middle Ages. That credit, especially with respect to ecclesiastical buildings, is generally ascribed to certain men of high rank in the Church,—while the claims of a body of working men, called Freemasons, to have devised and directed the operations necessary to the development of their employer's wishes, have also been put forward. Searching into the numerous printed as well as MS. authorities, whence these respective deductions have been drawn, I have been induced to form a collection of notes which enable me to have the satisfaction of bringing before the Institute a classified account of the official situations of persons upon buildings erected during the Middle Ages, with

[85] More than a quarter of a century has elapsed since Mr. Papworth's original Papers on this subject appeared in the TRANSACTIONS. On the 23rd January 1860, he read a Paper on the "Superintendents of "English Buildings in the Middle Ages, with especial reference to William of Wykeham." About two years afterwards (2nd Dec. 1861) he supplemented it with "Collections for an "Historical Account of "Masons, their Customs, Institutions, &c.," adding thereto a valuable detailed "Index." But, prior to this last, the late Mr. Burges, in November 1860, read a Paper on "Architectural Drawing," in which the facts and references he brought forward were closely connected with the former researches. These contributions, perhaps as important as any ever published by the Royal Institute of British Architects, having been now thoroughly revised under the care of Mr. Papworth, are here reprinted, with further notes and other addenda, collated by him. The esteem shown for his original Papers has been proved by the reference to them and reprints from them in various publications, especially by Mr. J. G. Findel (*Hist. of Freemasonry*, 8vo, Lond. 1866, translated from the German); and by Mr. R. D. Gould (*Hist. of Freemasonry*, 4to. 6 vols., Lond., 1882-87,) who, to some extent following the same enquiry, not only availed himself largely of the contents, but carefully added to them, criticised various portions, and elaborated others. Associated as these Papers are with current questions of Technical Education, and with professional practice in its mediæval aspect,—elucidating as they do in some measure the questions raised this year by correspondents in the *Journal of* PROCEEDINGS,—the Council have sanctioned their reprint, and they are recommended to the careful perusal not only of those members who do not possess the original edition, but of the whole Body.

some general idea of their duties. Wherever practicable, I have chosen the words of the original document, or the apparently best translation; a course which has led me to discard some of the hitherto received quotations.

THE SUPERINTENDENTS.

Architect and Ingeniator.—Of the term Architect, I find no use within the period to which I propose to limit my remarks.[86] Walpole, in "*Anecdotes, &c.*" 1762, recites a writ, dated 1199 (10th Richard I.) wherein one Elyas, Ingeniator, was allowed ten marcs by the Sheriffs of London and Middlesex for the repairs of the King's Houses at Westminster. This word has been translated "Engineer or Architect;" and Walpole, stating that Elyas was certainly an Architect, mentions this writ, with another, a few years later, as being the earliest evidences of art in our records. This memorandum is valuable as far as it goes; but the original term in the writ may be properly translated Engineer. The terms Ingeniator and Ingeniarius, from a machine or engine, especially one used in war, may mean one who designed, constructed, or worked such a machine. The names of Waldin, ingeniator; Heppo or Helpo, balistarius; and Odo or Ody, arbalistarius and balistarius, occur in Domesday Book, at Lincoln Castle.[87] It also occurs in 1160 at Berkhampstead. In 1170 Ricardi ingeniatoris de terra sua de Wolveston, and, vir artificiosus fuisset opere et prudens architectus in omni structurâ artis forissecæ, is named; he was employed by Bishop Pudsey in works at Norham Castle, and was probably succeeded by William, ingeniator, [See page 208, footnote 133.] as recorded 1197. In 1186 Mauricius was ingeniator at Dover Castle. 1204, Forcinus, ingeniator at Colchester Castle. 1205-6, Bayard at Nottingham Castle. 1206 or 1216, Peter, ingeniator, was paid ninepence a day; Albert and Gaufridus, about 1252, were ingeniators at the Tower of London. 1285-6, Master Richard the engineer, and Henry de Oxford, carpenter, received £100 for carpenters' work in the hall at Conway. 1299, Fratri Roberto de Ulmo, magistro ingeniatori retendo ad vadia regis—IX den. per diem, &c. 1300, Thomas de Hokyntone or Hoghtone, ingeniario, was concerned with the tomb to Queen Eleanor in Westminster Abbey. John le Convers made the tomb and was paid V marks.

1540-44 (King Henry VIII's reign), German and Italians, "expert men in the skill "of fortifying" were employed. Amongst them was Stephen the Almayn, or Stephen de Hashenperg, who 1540-2, designed Sandgate Castle, Kent (to whom reference will be made hereafter); and in 1541 was concerned in the fortifications at or near Carlisle.[88] The following may be added though of a still later period:—1653, in the contract for

[86] The title "Architect" appears to have been introduced into English books about the end of the reign of Queen Elizabeth, being found annexed to the names of Shute, Simonds, Abel, and some few others of the time. Shakespeare uses it only once, and that instance is in the somewhat doubtful play of Pericles, Prince of Tyre.—W. P.

[87] Associated Societies, *Reports and Papers*, 1876, p. 189; and they occur as tenants in chief in the Roll of Landowners in Lindsey, temp. Henry I; *idem*, 1882, pp. 184, 193, 201, 186, 211, 212, 213.—W. P.

[88] Prof. T. H. Lewis, *Castles of Sandown and Sandgate*, read, 1883, at British Archæological Association, 8vo., 1884, p. 175, &c.—W. P.

building the church at Ayr in Scotland, certain parts were to be built "according to the "rule set down by the ingineer;" 1689-1702, a drawing in the British Museum, Bib. Reg., l, 39, is a "draught of William Town in Lochquaber *alias* Inverlochie, by Theodore Dury, "their Majesties chief ingineer in Scotland."

Supervisor.—A term in use several years after the Conquest was Supervisor; and this word has generally been translated Surveyor, or perhaps Overseer. The earliest mention of a supervisor or surveyor of the works (even the term architect has been applied in the translations), is in the case of the erection of a bridge at Hereford, between the years 1100 and 1135, when Alduin de Malverne is said to have held such an office. Passing some uncertain uses of the term, we are told that, in 1349, Edward III. appointed John Peyntour to the office of surveyor of the works at Windsor Castle. I am inclined, however, to believe that if the original document were inspected, the word so translated would prove to be supervisor. I lay some stress on this point, because my endeavour is to show that the office of supervisor, although changed to surveyor in later times, never meant the surveyor of the present day. In the following year, Richard de Rotheley (or Richard de Rochelle) appears to have held the same office; he is also recorded to have held it once before. Subsequently, but in the same year, William de Hurle and William de Herland also received the appointment. The following year, 1351, Robert de Bernham, clerk, held the office; "and," as is recorded, "to the end this great undertaking might be "honestly and substantially performed, the King (Edward III.) assigned John Brocas, "Oliver de Burdeux, and Thomas de Foxle, jointly and severally, with all care and dili-"gence (at least together once a month) to survey the workmen and their works, and to "encourage such as did their duty competently well, but to compel others that were idle "and slothful."[89] Bernham still held office in 1353; and it was on the 30th October 1356, that *William of Wykeham*[90] was appointed to the post of "supervisor of the King's "works at the castle and in the park of Windsor,"[91] having the like powers with those surveyors first named; the payment was also the same as that enjoyed by his prede-cessors, namely, one shilling per day while resident at the works; two shillings a day while travelling; and three shillings per week for his clerk. These allowances had been first of all made to Richard de Rochelle. The following year his salary was enlarged to two shillings per day, "until he should obtain ecclesiastical preferment."[92] I have been thus particular in the remuneration, because the *Clerk of the Works* at the Castle, a few years earlier, was paid, according to the authority I follow, "two-pence" per day, but this is clearly a mistake for two shillings, the usual payment for the "clericus operationum "regis." This difference would lead us to consider that the supervisor ranked lower than the clerk of the works. Moreover, it is recorded that, in 1358, William de

[89] Ashmole, citing Patent, 25 Edward III., p. i., m. 12.—W. P.

[90] The name is used as now usually written; it is to be found as Wickham, Wykham, Wykeham, Wyckham, and Wikham. He has also been called William Perot and Perotte. Also the son of John and Alice Longe.—W. P.

[91] 1356, 30 Oct. Rex—assignavimus—Will. de Wykham supervisorem operationum nostrarum in Castro nostro de Wyndesore, &c.; Walcott, p. 12, from *Harl. MS.* 6960, f. 59, al. 31.—W. P.

[92] 1357, 14 Nov. Walcott, p. 12, from *Harl. MS.* 6960, f. 35.—W. P.

Mulsho was appointed supervisor at the Castle; where then was Wykeham? And again, on the 10th July 1359, a writ [93] testifies that Wykeham was "capitalem custodem "et supervisorem castrorum regis" of Windesor, Ledes, Dover, Hadlee, and other places, which included something more than mere works in progress. In 1361, this William de Mulsho was appointed clerk of the works here and elsewhere; and in the following year, when Wykeham resigned his appointment of supervisor, he was succeeded by Mulsho, [94] who appears to have held the appointments of both clerk and supervisor until 1364, when Nicholas Bernard took the post of "surveyor" (as he is called in the translation) for life; and in 1366, Adam de Hertyngdon became clerk of the works in place of Mulsho. As these transactions are genuine evidence, it is clear that the supervisor, if promotion and remuneration be taken into the account, was of lesser rank than the clerk of the works. I have also found a notice of this office as late as the time of James I., when Sir John Trevor is called "Surveyor and Receiver of our Honor "and Castle of Windsor." For the present, however, I must quit Windsor, and see what information other records afford towards clearing up the point. The next in my list, after that of 1366, is dated 1370; in this, Thomas Staple, called the King's Serjeant-at-Arms, is granted a shilling a day for good service rendered; in the same year he is termed by the translator surveyor, and also overseer, of the works of the Lord the King at Queenborough Castle: he had upwards of £153 (about £1,850 of our money) paid to him for the works then being executed or completed. Was he an architect? In the same year also, 1370, the Prior of Rochester Cathedral was paid a somewhat larger sum for works at the Castle in that city, while acting as "surveyor" or as "overseer." John Boyfield (abbot 1377-81) had been supervisor of the works under the two Abbots of Gloucester (1337-77) preceding himself; he is one of the proofs of the supposed system of electing monks, acquainted with building and other operations, to the higher and responsible positions of Prior and Abbot. [95] William de Chaillou, surveyor of the king's works at the Tower of London and at the Palace of Westminster for about two years, was then appointed clerk of the works at St. Stephen's Chapel and at the Tower, the works at the two places being usually supervised by the same officer. He was succeeded by Robert de Pippeshull who was eventually appointed Controller. There are instances in which the Controller was appointed supervisor. William de Lambhith went through the same appointments as Chaillou; and their successor, William de Sleford, was clerk and supervisor; as was John Arderne at the Tower and elsewhere. In the reign of King Henry VI., John Golding was chief carpenter, disposer, and surveyor

[93] 1359, 10 July. Rex constituit clericum suum W. de W. capitalem custodem et supervisorem castrorum regis de Windesore, Ledes, Dover et Hadlee, et omnium maneriorum suorum de veteri Windsor et nova Windsor, Wichemere Kenyton, Shene, Eltham, Childerlangle, et Ledes ac parcorum ad eadem castra et maneria spectantium, &c., *Harl. MS.* 6960, f. 40*a*, al. 77.—W. P.

[94] This William de Mulsho and Adam de Hertyngdon (mentioned lower down) were both ecclesiastics and canons of the New College of Windsor; 1375, Robert Harresworth was appointed Supervisor during the King's pleasure.—W. P.

[95] The fine groined vault of the choir, the high altar and presbytery, the north transept, the cloisters began, and completed by his successor.—W. P.

of the King's works at the Tower and Westminster, with a fee of £20 per annum; and his successor received the same.

There is one other employment of the term supervisor, and, as it is found in the words of Wykeham himself, the meaning is of great importance. In his Will, he directs that the works of the Cathedral at Winchester are to be continued under the care of William Winford; of Simon Membury, now supervisor of the said work and also paymaster, who is to be paymaster and supervisor during the continuance of the above-named work; and of John Wayte, the comptroller on the part of the monastery.[96] It will be observed, that he does not state the exact position which Winford held or was to hold; but as I shall have again to refer to him, I will leave further remarks for that occasion.

Dated 1417 and 1422, are two orders, giving about the earliest uses of the word surveyor; in the first is mentioned, "Notre amé Esquier Robert Rodyngton, surveour de "la construction de noz Toures a Portesmouth;" in the other, "une surveiore de les "oveignez de devf. chastell et villes deing Northgales." But how shall we regard another order, dated 1417, requiring "sum gud, true, suffesaiunt mon, to be surviour of vitel and "werkes in North Wales?" This curious union of appointments appears again in 1338, when Edward III. made his clerk of the works at Perth, in Scotland, "receiver of the "pennies and of victuals;" and in 1384, Richard II. made his chamberlain of Berwick the clerk of the works there, and also "keeper of the victuals and artillery;" in the same year he was also constituted the "chancellor and chamberlain." During the erection of King's College Chapel, at Cambridge, we find recorded, in 1441, an overseer and manager; in 1451, a clerk of the works; 1479, an overseer; 1484, an overseer; 1513 to 1527, a surveyor, in the person of Thomas Larke, termed "Mr." in the first year, but "clerke, Arch-"deacon of Norwyche," in the latter year. All Souls' College, at Oxford, was erected under the supervision or inspection first of John Druell, 1437-42, and subsequently of Roger Keys, 1442-44; and they kept the accounts which were in existence at the end of the last century. Roger Keys had previously (in the words of the grant) rendered such "acceptable and laudable services, and in many and divers ways renders, and will in future "render to us, as well in our operations connected with the building of our Royal College "of St. Mary of Eton, as in other respects"—that the monarch, Henry VI., ennobled him by a grant of a coat of arms.[97] He had acted as master of the works (an office to be referred to hereafter); Robert Kent, William Lynde, and William Warryn were to be the overseers, William Lynde being also the clerk of the works; and John Hampton, Esquire, an attendant upon the king's person, being surveyor.

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[96] The whole is as follows:—"Volo etiam et ordino quod dispositio et ordinatio hujusmodi non operis "fiant per magistrum Wilhelmum Winford, et alios sufficientes discretos et in arte illa approbatos et "executoribus meis in oportuerit deputandos; ac quod Dominus Simon Membury nunc dicti operis "supervisor nec non et solutor, sit etiam solutor et supervisor in futurum, durante opere supradicto, per "supervisum testimonium et contra-rotulationum fratris Johannis Wayte dictæ ecclesiæ meæ Commonachi, "nuncque ex parte dictorum Prioris et Conventus Contrarotulatoris operis supradicti, dum modo sanus "et incolumis fuerit, et circa hoc labore potuerit," &c. Lowth, App. xxxv. of edit. of 1758.—W. P.

[97] Tighe & Davis, *Annals of Windsor*, 8vo, 1858, i., 334-5.—W. P.

In 1461, to John Kendale was granted the office of "supervisor of all the King's "works" throughout the realm. In 1474, Richard Beauchamp, Bishop of Salisbury, was "master and supervisor of the works at St. George's Chapel, Windsor, then being rebuilt; he was succeeded by Sir Reginald Bray with the same titles. The Tower of Magdalen College, Oxford, was added after 1491, at which time Magister Gosmore had the supervision, which included keeping the accounts of it.[98] To John Alcock, successively Bishop of Rochester, Worcester, and Ely, and Lord Chancellor, many works in architecture have been attributed, probably because he held the office of comptroller of the royal works and buildings under Henry VII. The monarch, in making John Islip, Abbot of Westminster, receiver of the money for his chapel at the Abbey there, gave him the supervisorship; and thus, chiefly, has Islip also had the title of architect attached to him.

So late as 1514, William Mavern, or Malverne, supervisor of the works at the Abbey of Gloucester, was elevated to the Abbacy. In 1520, the king granted to Thomas Vachell the office of supervisor of all and singular the honours, castles, &c., &c., which had belonged to the monastery of Reading and to the late priory of Leominster, for his life, and to receive out of the issues and profits of the same, twenty marcs annually (£13. 6s. 8d.). He is again called "supervisor or inspector." From this period the term surveyor becomes very common, and it shortly appears to be used in the modern sense of the word. Thus, James Nedam, carpenter, was in 1531 appointed carpenter to the king, and in 1539 or 1541, he is named surveyor-general of the king's works, and had the same salary as his successor, Lawrence Bradshaw, also a carpenter, viz., two shillings per day, the payment, as I have before noticed, of the king's clerk of the works.[99] There was a Surveyor at the Tower of London, in 1542, at the same salary, which was increased forty years after by an augmentation of an allowance of £70. for diet, and £25. 13s. 4d. for riding charges and boat hire.

About 1510 the endowment of St. Paul's School, London, was given to the Mercers' Company, to whom was entrusted its care, charge, rule, and governance; and they were to elect eleven persons annually, free of their Company, as "surveyors of the scole." These persons were to receive the rents of the endowments, and to transact all affairs relating to them and to the School—to pay the different salaries quarterly; and when the annual accounts were audited, an assembly should be appointed, and "a litell dinner "ordeyned by the surveyors not exceeding the price of fower nobles." These surveyors were to have eleven shillings each for their labour for one year, and the same sum if they rode to visit the estates. A similar sense of the word is to be found in a legal document of 1680, stating that Sir C. Wren, with the parson of the parish and another person, had been appointed "supervisors" of the building to be erected, and which had been designed by that architect. In 1555, when water was to be conveyed from Blackmore

[98] The college was founded 1457, by Bishop William Waynflete, who bargained with William Orchyerd to be "master of the masonry," and for other works, 1479-80, portions to be "after the model of "All Souls." This celebrated Tower, erected 4 Aug., 1492-1508, was probably by another hand.—W.P.

[99] Nedam was master of the Carpenters' Company of London in 1536; and Bradshaw in 1551, 1555, 1562, 1567, 1571, 1574, 1579, and part of 1580, in which year he died. See *Journal of* PROCEEDINGS, 1886-87, Vol. III. p. 394; from Pocock, *Hist. Account of Carpenters' Company*, 1887.—W.P.

Park to Windsor Castle, John Punchardon was the "serjeant plumer;" John Norys, Esq., controller of the Honor and Castle; and Richard Woodward, clerk of the same, "having "the oversight and payment of the works." Roger Amice, surveyor, is also named, who viewed and appointed stone at Reading for building the fountain. The building of the Alms' Knights' Lodgings was carried forward under R. Woodward, and R. Amice, surveyor of the same, and also called the King's surveyor. He was also the surveyor of the Queen's lands in the County of Buckingham, assigned to survey, view, and oversee the said works, and for the costs, charges, paines, and travaile of himself, two men and three horses attending to view, oversee and survey the said workmen, by the space of 130 dayes —he was paid 7s. per day. During the reigns of Elizabeth and of James I., the head of the Royal establishment of Works loses the title of *clerk of the works* (to be mentioned presently) and becomes "surveyor and paymaster;" and in 1628, "Mr. Jones" is surveyor. From that period we are well acquainted with the duties of that officer, as now understood. The duty of the surveyor-general at the Tower of London, in 1756, was chiefly to inspect the stores and provisions of war; to see they were preserved with care; to allow bills of debt; to keep a check upon all labourers' and artificers' work; as well as to see that all provisions were good and serviceable, and that they were marked with the king's mark.

It is only occasionally that we find any mention of *the duties of the supervisor.* In the case however of Wykeham, the first patent, as recorded by Ashmole, states that he was empowered to impress all sorts of artificers, and to provide stone, timber, and all other materials and carriages [footnote 91]. The second patent [footnote 93] was an extension of his powers, as beside the appointment and disposition of all workmen, providing necessaries for reparations, he was to provide carpenters, masons, and other artificers, stone, timber, &c.; also to hold leet and other courts, pleas of trespass and misdemeanours; and to enquire of the King's liberties, rights, and all things appertaining thereto. Would not our word "Steward" be a more appropriate interpretation of the word "Supervisor" when used in the old records? In support of this view I would mention that Shakspeare, in his play of Henry VIII., act 1, sc. 2, gives the term "Surveyor" to the Duke of Buckingham's Steward of the Household, (as I read the passage),—thus recalling the old term supervisor; and again, Shakspeare (to judge from Henry IV., 2nd pt., act 1, sc. 3) may perhaps have quite understood the difference between such an officer and an architect or a surveyor of buildings; but this last use of the term might be interpreted both ways. In some of the old manuscript histories of masonry occurs the passage—"St. Albans was "a worthy knight and steward of the king and of his household, and had government of "his realm, and also of making the Town walls, and loved masons well." Fitzherbert, on *Surveyinge*, 1st. edit., 1534, and 2nd. edit., 12mo., 1567, fol. 43, writes:—"The name of a "Sarueyour is a french name and is as muche to saye in Englyshe, as an Ouerseer." Another example occurs in a "Grant to William Tayleure of the offices of steward, "receiver and bailiff of the manors, &c., of Windsor; also of clerk to the constable and "of supervisor of the Castle;" this is to be found in Domestic Records, Rolls Office, June 1660, p. 72. Does this show a great change of responsibility?

Sacristan.—At Croyland, the "Magister Operum," was the first of the six greater officers. It was the Sacristan, or sometimes the Treasurer, who held this post, a very important office in monastic establishments. It was his duty to receive all the legacies and donations that were made for the support and ornament of the buildings and utensils; to his superintendence was submitted the construction, reparation, beautifying, and enlarging of the churches and various buildings of the monastery, particularly those of the Abbot below the court, except some houses near the garden. John of Wheathamsted, Abbot of St. Albans, "who in architecture was the Wykeham of his time," is specially recorded to have instituted, in his Abbey, a new officer called the Master of the Works. In one of the Durham Fabric Rolls occurs,—"Item, buildings and repairs in the church "made by the sacrist in virtue of his office, £386. 15s. 0d." In another, "The master "mason to be paid by the sacrist." The sacrist was also sometimes the secretary, auditor, and chancellor of the monastery. With this extensive employment it is remarkable how few names of sacristans, as designers, have come down to us. William Stowe, of the Abbey of Evesham, erected about 1319 the new steeple or belfry. Paulinus, of Rochester Cathedral, built between 1125 and 1137 the church at Frendsbury, in the same county. In 1237 died Elias de Lideford, of the Abbey of Gloucester, who rebuilt the tower, and constructed the stalls of the monks, and vaulted the church. This officer, in St. Oswald's priory at Nostel, in Yorkshire, about 1380, painted the refectory with his own hands, made new stalls in the choir, a new incense pot, a large processional cross, and some gold and silver images of saints in tabernacles for the altar. But of all sacristans, we surely shall not forget Alan de Walsingham, of Ely Monastery, cir. 1321-64, one whose history is too well known for it to be necessary to be repeated here, and who is another example of the difficulty of understanding how he could have gained instruction in art."[100]

Master of the Work.—At Croyland, he was the first of the six greater officers. At Salisbury, the nature of his duties does not seem to have been noticed by the historians of the cathedral of that city; but in 1334, "although there was a regular master of the "works, the chapter recurred to R. de Farleigh, 'builder,' who was to be entrusted with "the custody of the fabric, to order and do all necessary work in the same, to superintend, "direct, and appoint useful and faithful masons and plaisterers," etc.: the translation of this agreement is given in Dodsworth, *Salisbury Cath.*, 4to., 1814, p. 151. In 1350, John de Lincoln held the office at the erection of St. Stephen's Chapel, Westminster. In the agreement made with John the plumber, in 1367, at York, it was arranged that he, the plumber, was to work with his own hand wherever he should be required by the master of the fabric or by another on his behalf; and if at any intermediate time of the year the fabric should not require his labour or repairs, having first asked and obtained leave of the chapter or of the master of the work, he might lawfully work elsewhere; he was to return when required by the master of the work. At the same period there appears to have been a keeper of the fabric, who was to settle the amount of the day's work for the plumber and his servants, and who was to pay the salary at the stipulated periods.

[100] Bentham, *History and Antiquities of the Cathedral*, 4to., 1771; with Suppl. by Stevenson, 4to., Norwich, 1817. Millers, *Descr. of Ely*, &c., 8vo, 1805, 1807, and 1834.—W. P.

The master of the work, and the keeper of the work, and the master mason, are also all mentioned together in a document of the same period, so there is no chance of confusing them one with another. Henry VI., in his Will, orders a payment of £50. per annum as salary to be paid to each of the masters of the works at his College of Eton, and of King's College at Cambridge; with £13. 6s. 8d. to the clerk of the works at each building. At the erection of St. George's Chapel, Windsor, Edward IV. appointed, 1474, Richard Beauchamp, Bishop of Salisbury, to the office of master and supervisor of the works; and in his Will, dated 1475, he says, "We wol that the Church of the said College " begonne by us of newe to be buylded bee thorughly finisshed in all things as we have " appointed it by the oversight and assent of the said Bisshop of Sarum during his liff, " and after his deceasse by the oversight of the Dean of the said College for the tyme " beeing, soo alway that our executours and supervisour of this our last wille and testa- " ment bee prive to all charges and expenses that shal bee expended about it." We can hardly imagine from this description that either this master, or this supervisor, had much to do with the designing of such works; yet, not only has the commencement of this magnificent building been always attributed to the genius of the Bishop of Salisbury,[101] but the completion of it has been equally attributed to Sir Reginald Bray (who succeeded him, and appears to have finished the chapel at his own cost), but whom I do not any more consider to have been a designer of architectural works than William of Wykeham. It appears, also, that Thomas Canceler was, early, the clerk of the works;[102] the name of his predecessor is lost. This Sir Reginald Bray has also had, times out of mind, the credit of designing Henry VIIth's Chapel at Westminster; he died, however, some few months after the first stone was laid, 24th January 1502; and the King refers in his Will, dated 1509, to the Prior of Saint Bartholomew's, in Smithfield, as the then master of the works of the chapel, who had a picture delivered to him by the King, of the manner in which the chapel was to be desked. This prior was William Bolton, who was himself a great constructor of edifices. Gough, *Croyland Abbey*, printed in Bib. Topog. Britt., 4to., 1783, iii., App. p. 51 and p. 73, gives a curious monastic record relating to this officer. Later notices occur in Britton and Brayley, *Palace of Westminster*, 8vo., 1836, pp. 61, 110, 198; and in Browne, *York Cathedral*, 4to., 1847, p. 161, 166. John Ashfield had, in 1492, paid to him the arrears of salary for nineteen years as late master of the new works at Bristol Cathedral. Prior John Martyn succeeded him in the office [Britton, *History*, 4to, 1830, p. 50-1]. Injunctions of May 1556, at Hereford state, " Item that the master of the work for the time being shall cause the quire to be " made cleane on this side and before the feast of St. Michael the Archangle next ensuing " so forth once every year under the pain of xxs. for every fault therein to be converted " to the use of the vicars of the quires commons"; as in Harleian MS. No. 396. In

[101] In the preamble of the Patent of his Chancellorship of the Garter, it is set forth "That out of " mere love towards the Order, he had given himself the leisure daily to attend the advancement and " progress of this goodly fabric;" Ashmole, *History of the Order, &c.*, 8vo., 1715, p. 84.—W. P.

[102] Cir. 1474 or 1478-9; Poynter, in Wyatville *History of Windsor Castle*, fol. 1841, declares that he had 10*l.* per annum. In the Harleian MS., No. 433, fol. 73*b*, &c., are statements "To determine T. C.'s " account for Windsor Chapel, &c., from 22nd Edward IV. to 1st Richard III.—W. P.

the *Dictionary* of Sir Thomas Elyot, fol. 1538, occurs "Maister of the Warkes, a deviser "of buildyng, architector et architectus." In 1701, Robert Streeter, painter, was master of the work to be done in the castle of Windsor, with the privilege of doing and performing the painter's work.

This officer would seem to have held a very similar position to that of the supervisor, if not almost one and the same, and his duty evidently was to keep the accounts as paymaster; occasionally giving directions as to carrying out the works. I find that in 1671, in Scotland, Sir William Bruce of Balcaskie, is mentioned as "His Majesty's "Surveyor," and also as "Master of the King's Works," being then engaged on the buildings at Holyrood House, near Edinburgh, executed 1670-9, but not altogether on his designs, for Robert Mylne was engaged as mason, &c. In 1751 William Adam, and James Adam, and R. Mylne, each had the title; while "masoun wrycht and maister of "wark" (craftismen) occur in the "Acts of the Parliaments of Scotland," fol., 1814, ii., 489-90.

Keeper of the Fabric and Keeper of the Work.—These are two titles which have been already mentioned in conjunction with the "Master of the Work." The earliest notice before me is appended to the names of Henry de Cerne, the treasurer, and others, at the Castle of Winchester, from 1222 to 1236, who are called "Custodes Operationum." About the same period Odo, goldsmith, of Westminster, held the same position at the Palace of Westminster; and numerous writs, as well to himself as to his son and successor Edward, show that they bought things for the use of the king, and had works carried out which, the king, "had enjoined him to have constructed." This Edward, more especially, was appointed one of the treasurers of the new exchequer constituted for carrying out the rebuilding of Westminster Abbey. The keeper of the fabric of the church at Westminster had upwards of 3,000 marks paid to him in 1257, the period of its rebuilding. The keeper of the works at the Tower of London had £20. paid to him to provide necessaries for the works, Master Thomas, of Saint Sepulchre, being overseer of the works aforesaid, and also called the engineer of the king's war slings in the Tower. Our next keeper may not have been worthy of his office, if the following report of him be correct:—William de Wylughes, keeper of the old fabric (or works) of the church of St. Paul in London, received £40. from the king for an iron tomb lately existing over the tomb of the Venerable Father Michael, late Bishop of London, without the west porch, purchased for the king's use for the tomb of Philippa, late Queen of England, within the Abbey of Westminster.[103] John de Wisbech, a monk of the monastery at Ely, was custos of the Lady Chapel, or the Trinity Chapel, a name by which it is better known, from its commencement until 1349, at which time it was nearly finished. Its design is also attributed to Alan de Walsingham, who while sub-prior, assisted in laying the first stone. The custos at the Palace of Westminster in 1332 was required to deliver up some lead which he had in his care. In 1350, the magister fabricæ of

[103] In G. G. Scott, *Gleanings from Westminster Abbey*, 8vo., 1863, p. 170, the tomb is attributed to Hawkin de Liege from France; the images are attributed to John Orchard or Orchyerd, stonemason of London; and 40*l.* was paid to Henry de Wylughes for the appropriated iron work.—W. P.

Lincoln Cathedral was also the treasurer of Lincoln. More especially from Browne's *History of York Cathedral,* published 1838-47, is to be obtained much valuable information. From the year 1311 until 1535, upwards of 200 years, there is a constant succession of keepers of the fabric; they all were receivers of the contributions for the works and paymasters; the Rolls of the Accounts are kept in their names; one is called master of the fabric. There is a curious incident connected with the three persons who held the office of keeper previous to 1535, which most probably would not have attracted the attention of any one not pursuing this course of enquiry. These three were Magister Christopher Seell, succentor of the vicars choral, and custos from 1515 to at least 1518, after which no fabric rolls are found until 1526, when Magister Thomas Marsar was custos until 1535. In 1525, however, Magister John Coltman, sub-treasurer of the church, was custos, as known from the following circumstance:—that the adjoining Church of St. Michael le Belfrey, belonging to the dean and chapter, was rebuilt in the time of Thomas Marsar, the second above mentioned, and there were, and are perhaps still, existing in that church, three stained glass windows with inscriptions, to the memory of these three keepers, and each is recorded therein, to have been "Clerk of St. "Peter's Works" (not keepers of the fabric). These inscriptions are in black letter English, and therefore there can be no error except in the acceptation of the term in our modern usage of it. The person often in charge of carrying out works at our cathedrals, and often resident in the precincts, still retains the title of clerk of the works. From the quality of the persons above described, we might presume that the services rendered were somewhat akin to those of an Accountant: the strange mixture of names and officers is most perplexing, and I fear I leave much that requires further elucidation.

Director or Master.—During the early years of the Mediæval period, another title obtained, yet so rarely, that but for the one name connected with it, I should scarcely have considered it of sufficient importance to be mentioned. The name is that of Elyas de Derham, or Berham. He is placed by Pugin along with Wykeham and others in his list of the best of the English Mediæval Architects, on the ground, I presume, of the words by which he is commemorated, as the "rector" for twenty-five years of the new works for Bishop Poore, of Salisbury Cathedral; at the same epoch, as we are told by the same authority, Leland, "Robertus Cementarius rexit per vigintiquinque annos." What shall be understood as to the real meaning of these words applied to the two men? —one, who was Rector, the ruler; and another, who Rexit, was the ruler also. This Elyas, or Helyas, was an important personage, having been also employed at the Hall at Winchester; as the king's ingeniator he was paid x marks to repair the king's house at Westminster; took money to King John at Rouen; was an executor of the Will of the Archbishop of Canterbury, died 1205, and receiver for the king of the revenues during the vacancy until 1207, &c. See "Robertus" hereafter under the same date.[104]

About the same period we find that the works at Windsor Castle were placed under the "direction" of William de Burgh, who was succeeded by Walter de Burgh in 1240.

[104] Some other references to him as a Director, will be seen in the "Winchester volume," to which allusion is made on page 203, in footnote 121.—W. P.

This Walter was also keeper of the manor of Kenyngton, and there are numerous orders from the king for improvements and alterations; also for works at Brill, at Cliff, at Geddington; and he is likewise called "Keeper of our demesnes." Under such a title, too, the monarchs were accustomed to appoint a person to each of the royal palaces for its care and preservation, often nominating some old servant to the office as a pensioner.

Clericus Operationum.—This officer is as important as any of those to which I have yet requested your attention. I have already mentioned how, in an Ecclesiastical establishment, the "Keeper of the Fabric," in three instances, appropriated this title as well. From the examples found, it might almost be concluded that it was retained for use by royalty only, for it so happens that with two other exceptions this designation is not met in connection with any works, other than those executed for the monarchs; one exception is on behalf of a member of the royal family, and the other on behalf of the kingly Wolsey; the three instances above mentioned appear to show that another name was adopted for this officer in other establishments. It must be premised that in the household of the monarch there was an office for carrying out royal works. This fact has not been noticed by my predecessors commenting on the histories of the palaces inhabited by the sovereign, as well as by other investigators of this period. The earliest list of such an establishment, which I have yet met with, is that of Edward IV., whose reign comprised the years 1461 to 1483.[105] The manuscript unfortunately is not dated. The clerk of the works therein has a fee of two shillings per day (equal to £36. 10s. per annum of the period), a clerk at sixpence per day, four shillings per day for riding expenses, and twenty-pence for boat-hire. The next officer is the comptroller, at one shilling per day; diet and riding, two shillings; and clerk, sixpence. Then follow the clerk of the engrossement of the paybook; the purveyor, with an allowance for his horse; the keeper of the storehouse; the clerk of the check; the clerk of the comptrollement; the carpenter (the mason in this list, perhaps by some error in copying, is omitted); the serjeant plumber; the joiner; the glazier; the surveyor of the mines, who has also £36. 10s. per annum; and lastly, the devisor of buildings, who has the same amount. The Society of Antiquaries published, in 1790, "Ordinances of the King's Household," amongst which is one called the Liber Niger, from a manuscript of the period of Edward IV. in the Harleian collection, No. 642, p. 1-196. In these Ordinances (p. 53) is the following passage connected with the office under consideration:—"Clerke of Workes, called by "the noble Edwarde[106] clerke dez œvres du Roy, preignaunt sa gages fees et lautres choises "appurtenaunte a son office par l'assignement du Thesaurere d'Angleterre de hors le charge "de l'oistiel du Roy. This clerke hath no duetie longing to him in this houshold, by "vertue of this office outward; but if he be appoynted by the Soveraynes of housholde "to take wages and cloathinge with the houshold, it mought cause hym to be the more "attendaunt for necessary byldynges in offices in this house; and so he may take lyvery

[105] *Harleian MS.*, No. 240.—W. P.

[106] It is not quite clear who this "noble Edward" may be, but as the first livery I have noticed was given in 1391 (see John Gedney subsequently), Edward III. (1327-77) may be meant, especially as he is referred to in the same work as an authority in matters of State.—W. P.

" as a squier of houshold." The next list is not earlier than the time of Elizabeth, of which there are several. In this and some late list the clerk of the works has become the surveyor and paymaster, and surveyor and clerk, and the payment varies. In 1614 Mr. Basill is the surveyor, who was allowed eight shillings per day, with fees at the rate of £80. per annum. The year 1610 affords a list of the household of Prince Henry, in which occurs the very acceptable name of " Inigo Joanes, Surveyor of the Workes;" the paymaster and overseer is Mr. Smith; and the clerk of the works, Edward Carter. We here obtain the modern acceptations of the words of office. Later lists of the royal household give the name of Inigo Jones, surveyor; Denham, later still, was surveyor-general; and Wren, surveyor of the works, is also known as surveyor-general. I must not now attempt to enter upon any of the numerous observations arising out of these very important lists in the history of our profession, which exhibit the precursor of the modern Board or rather Office of Works under the Government.

I will now refer to the notes which I have compiled of many of those who have held this appointment of Clerk of the Works. The earliest is in 1241, 25th Henry III., when directions were given for certain works at Windsor Castle being done by these officers; similar orders were issued in 1242 and 1244. During the erection of Caernarvon Castle, begun 1284, the clerk of the works was paid 8d. a day, and the master of the works 13s. a week, or 2s. 2d. a day, the Sunday not included. The Sunday, it appears, was paid for to those officers who had a yearly salary, the accounts often mentioning the 365 days at the 6d. or 1s. per day. A lapse brings us down to 1316, when Nicholas de Tykhull, late clerk of the works at the king's palace at Westminster, was paid £14. and upwards, for certain timber and planks used against the coronation of Edward II. In 1320, John de Ditton was appointed clerk and keeper of the king's works (this recalls the nomenclature of the officer at York) at the Palace of Westminster and at the Tower of London. In 1326, William de Chaillou, who was acting as surveyor or supervisor, was appointed clerk of the works at both places, which also entailed the honour of looking after St. Stephen's Chapel, then erecting. About three years afterwards, William de Kelleseye succeeded him, and was invested with office by the controller three days afterwards. Both these clerks kept the accounts of receipts and expenditure. John de Feryby held office in the same places in the same year, and had it granted to him for life. In 1331 Walter de Weston was clericus operationum domini; in 1333 he has the title of custos operacionum; 1349, was created chaplain to the king, who bestowed upon him the sixth prebend in St. Stephen's Chapel; he kept the accounts. Peter de Bruges, in 1347, was clerk of the works at Westminster, whilst Weston was keeping the accounts at the Tower until 1351, when Robert de Campsale succeeded him at both places. The latter was succeeded by Thomas de Stapelforde, who appears to have been acting previously as controller. In 1356 William de Lambheth was appointed supervisor, and two years afterwards clerk of the works. In 1361 William de Sleford (one of the king's chaplains and a prebendary of St. Stephen's, and was made dean of it 17 May 1369) was also appointed supervisor, and in the same year he was clerk of the works; whilst in 1365-6 he is termed clerk and supervisor, and was paid one shilling per day.

Leaving Westminster, and returning to the year 1327, I find the constable of Windsor Castle was directed to pay Ralph de la More, clerk of the works, his wages at two-pence per day (as I have before stated, I consider this a mistake for two shillings). No other such officer has been found at Windsor until 1361, when William de Mulsho was appointed clerk of the works at Windsor and elsewhere; he was also dean of St. Martin's-le-Grand and canon of Windsor. Adam de Hertyngdon, who succeeded him in 1366, was, 1370, a canon of Windsor. 1370, Robert de Sybthorp was clerk of the works at Shene, Eltham, and Rutherhythe; Henry de Mannesfield, at Childerlangley; John Edward, at the Castle of Ledes; Richard Bernard, at the Castle of Odyham; and Richard de Blore, at Quenesburgh Castle—all royal property. William de Wykeham held the appointment for a few months only, at the manors of Henle and Yeshampsted, in 1356. In 1382 Arnald Brocas was clerk of the works at Westminster, the Tower, Windsor Castle, and divers others of the king's castles and manors; he seems to have been a sculptor and painter also. In 1395 John Godmanston was clerk of the works of the King's Great Hall at Westminster, although Strype and Stow state that John Boterell was the clerk; but as there appears to be a slight error in the date of 1395 for 1397, he may perhaps have succeeded Godmanston. On the 12th July 1389 Geoffrey Chaucer, the poet, was appointed clerk of the works, and his patent mentions not only Westminster and the Tower, but also Berkhamstede, Kenyngton, Eltham, Claryndon, Shene, Byfleet, Childerlangley, and Feckenham.[107] On a careful consideration of the accounts of his life, I cannot find any circumstances to warrant a supposition that he was so eminently acquainted with building operations; the twenty months he held the appointment afford some grounds for the supposition that he had not the knowledge, and the power to appoint a deputy would also lead one to the same inference; the period, too, at which the office was given to him strongly marks the fact of the king bestowing, on a favourite, a gift for good services rendered.[108] John Gedney, his successor, 17th June 1391, also appointed a deputy; and he is the first clerk of the works I have found recorded as having had a certain quantity of cloth given to him for a gown or livery. In 1407 this officer was Henry Merston, who also had a livery. From 1411 to 1413 Robert Rolleston acted at Westminster and at the Tower. He was succeeded by John Straunge in 1413, who in 1416 is recorded to have received a livery, and was engaged at Shene Palace in 1413 and 1418. In 1422 John Arderne held the office, and worked on the tomb of King Henry V. in Westminster Abbey; and, 1435, received his livery. In 1440 William Lynde, as early mentioned herein, was clerk of the works at the College of Eton. In 1445 William Cleve, "the King's poure chapeleyn," petitioned for the payment of £1000. for works done

[107] See his *Life*, by Godwin, 4to, 1803; also the *Life* prefixed to the *Tales*, in T. Wright's edition of 1847. The *Life* by Sir Harris Nicolas contains some facts not known before. Godwin considers the salary of £36. 10s. to be worth £657. of modern money. He only held it for twenty months.—W. P.

[108] Auditor Benson was appointed surveyor general, and also Denham, but we know their incapacity. Imagine Tennyson, Poet Laureate, taking the place of Sir Charles Barry at the Houses of Parliament! John Judde, a merchant of London, was made master of the Ordnance for his life by King Henry VI., Dec. 1456, because he had presented him with 60 guns, called Serpentines, and materials for twenty tons of gunpowder.—W. P.

at Eltham, Shene, Westminster, and the Tower. John Canterbury was clerk of the works at the commencement of the erection of King's College Chapel, Cambridge, in 1451, having previously been engaged at Eton as Lynde's successor. In 1474 Thomas Canceler held that situation at Windsor, where he had £10. per annum and a livery: in 1483 his accounts were ordered to be determined (see previously). In the early part of the reign of King Richard II., Thomas Hunt was appointed clerk of the works for life; and in 1484, Thomas Danyell is named. In 1510 Henry Smyth was clerk of the king's works. Then, about 1550, Eustace Mascall was clerk of the works to Cardinal Wolsey at the building of St. Fridiswide, in Oxford (this is one of the exceptions in the use of the title), and who for seventeen years was chief clerk of accounts for all the buildings of King Henry VIII. within twenty miles of London. From 1555 to 1558 Richard Woodward is named as the "Clearke of the Honor and Castle of Windsor." In 1575 Humfry Michell, the clerk of the works at the castle, asks leave to resign his office on account of the difficulties and opposition met with in discharging his duties, and the delays in procuring money and passing his accounts. Probably he was acting as clerk of the works as now understood. The effects of this remonstrance appears to have been his appointment as superintendent of all payments for repairs done to the Castle, under a warrant from the constable, the Earl of Leicester, who at the same time nominated Henry Hawthorne to be surveyor of the works. The salary of each of these officers was two shillings per day. There is much similarity in the office held by Wykeham to this appointment of Michell, as superintendent of all payments for repairs done. In this case, however, Michell was under the constable; in Wykeham's case, by his second appointment, Wykeham was also the constable, "capitalem custodem et supervisorem."

The second exception, which I mentioned at the beginning of this division, comes under the late date of 1435; the clerk of the works is once named in the contract for the erection of Fotheringay Church for the Duke of York, in the paragraph, "And yf so "be that the seyd Will. Horwode (the freemason or builder employed) mak nought full "payment of all or any of his workmen, then the clerke of the werke shall pay him in "his presence, and stoppe als mykyll in the seid Will Horwode hand, as the payment "that shall be dewe unto the workemen comyth to;" clearly showing what was at least one part of his duty.

Among the foregoing observations will be found, I think, an elucidation of some points hitherto generally considered obscure. The salary of the clerk of the works has been stated to be exceptional, whereas I have shown that it existed for many years, and at nearly the same amount. Sir Christopher Wren received £45. 12s. 6d., the usual fee for the office of surveyor-general being, for himself, at two shillings a day, and a clerk at sixpence a day. If I mistake not, it has always been considerered that the livery of this royal officer (withdrawn temp. Charles I.) was first given to Inigo Jones, whereas it was a customary present some 150 years previously; and at the burial of King Edward VI., the surveyor of the king's works had seven yards of cloth, and each of his three servants three yards.

Devizor.—This officer has the same remuneration as the clerk of the works. Many will remember the conjunction of the term with the name of John of Padua, who is styled "Devizor of his Majesty's Buildings," on the faith of two patents dated 1544 and 1549, granted to him by Henry VIII. and Edward VI.; but on referring to the documents as printed,[109] I cannot find the slightest mention of the word devizor; nor have I been able to discover the name of any person appointed to that office. Vertue, or Walpole, states John of Padua's "office seems to intimate something novel in his practice. "He was termed Devizor of his Majesty's Buildings. In one of the Office books which I "have quoted there is a payment to him of £36. 10s. 0d." To this Office book, however, no clue is afforded;[110] and were it not for the lists I have already quoted, I should have felt inclined to consider the whole as a misquotation. Dallaway, in the notes to his edition of Walpole's *Anecdotes*, in 1826, observes that John of Padua "acquired a title "not before that patent given to any architect;" so that he evidently was not aware of the lists to which I have referred. Hunt, in *Tudor Architecture*, 1836, p. 24, states, "it "appears, indeed, that in those times the 'Devysor of the Works'[111] acted invariably under "a supervising officer who, leaving the artist's fancy and genius unshackled, controlled and "restrained the expenditure of money." This is exactly the position held, I consider, by Wykeham at Windsor. Also, that "it was common to depute the superintendence of "buildings to Churchmen, from an idea of their superior prudence and probity," quoting Warton, *History of English Poetry*, 1774-81, who also states that Wykeham "is "supposed to have recommended himself to Edward III. by rebuilding the Castle of "Windsor. This was a recent and notorious instance.[112] But in this appointment the "king probably paid a compliment to that prelate's singular talents for business, his "activity, circumspection, and management, rather than to any scientific and professed "skill in architecture which he might have possessed. It seems to me that he was only "Supervisor or Comptroller on this occasion." "Mr. Dallaway," adds Hunt, "without "mentioning his authority, says the name of Wykeham's superintending architect was "William Wynford: assuming this to be correct, Warton's is a fair inference." So that I have not the merit of originating the suggestion—"Was Wykeham an Architect?"

[109] The first patent is printed in all the editions of Walpole's *Anecdotes*.—W. P.

[110] The above statement is made by him on p. 114 of the 1762 edition. On p. 55 two Office books are named, one "was in the collection of Mrs. Bridgman, of Hanover Square," and the other "in the "Library of the Royal Society."—W. P.

[111] The Secretary of the Institute, Mr. White, has suggested to me that this designation of "Devizor" may be derived from the French word *devis* or *deviz*, an exact description of the dimensions, quality, and formation of the materials of a building, made after the drawings annexed to it—in fact a specification and an estimate combined. This would rank the devizor as an estimator and disposer rather than as a designer. The title is found in the list of the Household of Edward IV. (1461-83); in those of Elizabeth cir. 1578, 1593, 1597; of James I. 1610; and of Charles I. 1626. Walpole's two statements have led all hitherto to consider that the devizor must have been an architect. In favour of the old meaning, I find the following among my notes:—"Frère Jehan Jocundus, religieux de l'ordre de "S. Françoys, diviseur des bâtimens, 1497," given in the Comité Historique des Arts, &c., *Bulletin*, 8vo, Paris, 1843, i. 168. Also "Sir John Woolfe, gardener, maker and deviser of herbors and grafts," 1548, 2nd Edward VI. Inigo Jones was named as "devyser for the said maske."—W. P.

[112] Alluding to Wicliffe's Sermon; see also Note 36.—W. P.

Whereas, "It is to be lamented," writes Gwyn, in 1766,[113] "that Wykeham did not pay "more regard to the science to which he owed the greatness of his fortune, by establish- "ing a foundation for the study of his own art, and others that depend upon it. Had "he fortunately done this, there is no saying what the consequence might have been: "possibly by this it would have been the fashion for ingenious men to come from Rome "hither to perfect themselves in the arts, and have bartered Italian for English "performances."

There is still a great controversy as to who was this John of Padua. Professor Willis considered him to have been Dr. Caius, the founder of Caius College, Cambridge; others that he was John Thorpe; and so on. The Rev. Canon J. E. Jackson, F.S.A., of Leigh Delamere, Wiltshire, has, after a diligent inquiry lately undertaken, suggested that he was probably either John Padovani of Verona, the maker of sundials, &c., and player on the organ, but of whose skill in architecture we know nothing; or John Maria Padovani of Venice, who was architect enough to embellish with sculptured ornaments and probably to build a royal mausoleum in Poland. The latter was a very celebrated musical composer, especially of "ballate" and entertainments of a lighter sort, suited to amuse a court. "The reader," adds Canon Jackson, "may choose which he pleases, "and will perhaps shelter himself under Mr. Daines Barrington's opinion, viz., that John "of Padua had most likely come from Italy as a performer on some instrument, and by "accident only was employed by Henry VIII. as an architect." This ingenious inquiry was printed in the *Wiltshire Archæological and Natural History Magazine*, 1886, vol. xxiii., p. 14.

It is very difficult to understand clearly the *Duties* of these officers. The "Overseer" would be, perhaps, the most easily explained; but his Latin designation, as used in the Records, is unknown to me, unless the Latin word "Supervisor" has been the one our translators have found. The English word "Supervisor," if that of "Steward" be questionable, is I think, best kept for those who, acting on behalf of others, as Wykeham for the monarch, have yet no grounds to be considered the designers of the building. The "Master of the Work," a designation used in the monastic establishments, whilst in Scotland it took the place of the King's chief professional man, was, I feel certain, one of the talented advisers of the day. The "Clerk of the Works" of the King's household (later "Surveyor") may have stood in the place of the "Architect," or of that of "Keeper of the Accounts" (it is not at all clear, but was probably the latter). The "Master, or Keeper, of the Fabric" was probably the keeper of the whole structure; and the "Keeper of the Work" was, perhaps, only the custodian of the particular works then in progress; the edifice under those circumstances being developed by the "Master of the Work," or by the "Master Mason."

There is one circumstance respecting nearly all these officers which perhaps needs a passing comment. It will have been remarked how very many of them were either Ecclesiastics or were rewarded with ecclesiastical preferment. But it must be

[113] Gwyn, *London and Westminster Improved*, 4to, 1766, p. 34.—W. P.

remembered that, during the period to which our attention has been confined, the Church was the only field for exertion open to those of the nobility and gentry who were not inclined to embrace the profession of arms; and also a means by which to obtain remuneration for a livelihood. Therefore, the clergy so called, would thus secure the offices at the disposal of the monarch and of the nobility.

WILLIAM OF WYKEHAM.[114]

Now, so far as the enquiry has been pursued, shall we not be rather inclined to deny that William of Wykeham is entitled to the name of "architect," in the modern sense of the word? Tradition, warping the meaning of early historians, has assigned to him wonderful powers of design in architecture.[115] Is tradition always to be relied upon? Allan Cunningham, in his *Life of Wykeham*, states that "under whose auspices he "attained his knowledge in architecture, has not been told, nor have we any notice "of any of his designs before his twenty-third year." We know how to estimate the real value of tradition in the case of Van Eyck, the reputed discoverer in 1410 of oil painting (he was born just after Wykeham was made Bishop, and he died about forty years after him); and again in the case of Sir Richard Whityngton, four times Lord Mayor of London, who also flourished during the last years of Wykeham's life. Not only is the origin of the story of "the Cat"[116] placed about a century after its supposed master's death, but it has been discovered that the pennyless Richard was the son of a rich man of title! An enlightened French author has acquitted the English of the traditionary crime of roasting the Maid of Orleans, and shown that she lived a married life for years after the date assigned to the event: while the sorrowful catastrophe of the interesting Amy Robsart has been reduced and vulgarised into a case of *felo de se!* The term, "rising "Wykehams," must be, I think, retained for the benefit of young ecclesiastics, rather than of aspirants in our profession, unless indeed the time shall come when an architect may again be considered eligible for a bishopric, as some slight return for the usurpation of the title of architect by so many bishops. It is said that it was partly Wykeham's knowledge of architecture which induced Edward III. to employ him; but if the authorities be examined, there is nothing except tradition to support the argument. It was by the advice and persuasion of Wykeham (in 1359 says at least one author, John Malverne, *Cont. Chron. Ranulph.*, as in Lowth, p. 19), that the king was induced to pull down great part of the Castle of Windsor, and to rebuild it in a magnificent manner.

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[114] The Bishop's family name is generally stated to have been "Longe;" he is supposed to have been born between 7 July and 27 Sept., 1324, at Wickham, in Hampshire, whereas the arms have been claimed by the Wykeham's of Swalcliffe, in Oxfordshire, as those of their predecessors, who existed in the reign of Edward I. See also *Journal of* PROCEEDINGS, 1886-87, Vol. III., p. 387.—W. P.

[115] Wykeham's name, as architect, has been connected with five chief structures. 1, Windsor Castle; 2, Queenborough Castle; 3 and 4, his Colleges at Winchester and Oxford; and 5, the alterations at Winchester Cathedral. See also *Journal of* PROCEEDINGS, as above.—W. P.

[116] The "Cat" is now considered to have been derived from Whittington's speculation in the coal trade during the first years of the XVth century, "Cat" being long after that the equivalent of "collier"; see *Journal of* PROCEEDINGS, 1886-87, p. 380.—W. P.

But works had been commenced there by that king some ten years previously. Moreover, Stowe says that it was at the suggestion of the kings of France and of Scotland,[117] who were prisoners together at Windsor during part of the years 1356 and 1357, that Edward III. was induced to extend the castle, and he did so at the expense of his captive advisers.

Another support of my argument is this: Wykeham was only made supervisor of the works in 1356 and again in 1361 [footnote 91]; Mulsho took his place in 1358, and Wykeham was appointed constable and supervisor[118] in 1359 [footnotes 93, 118]; the alterations proceeded slowly when, from 1363 to 1366, the amounts are highest. Now, Wykeham resigned his appointment to Mulsho in 1362, the year before the heavy payments began, and at the time when Mulsho was acting as clerk of the works there. The traditional account of the words "Hoc fecit Wyckham," attached to the walls of Winchester tower, is put aside by some of his biographers;[119] and Lowth[120] commenting on his early life observes that all the particulars relating to his name, birth, parentage, [education, and early employment], rest either upon tradition or upon accounts penned many years after his death, that is, at least, above fourscore years after the times of which they treat: we have nothing concerning him authenticated by contemporary evidence before the year 1352, when Bishop Edyngdon constituted him his attorney to take possession of certain lands; at that time he was twenty-eight years of age.

It may be in the recollection of many that even the chevron, or two chevrons, in the coat of arms adopted by Wykeham, was said[121] to be commemorative of his archi-

[117] "These strangers commending the situation and judging the castle to have been better in that "place than where it was, as being on higher ground, and more open to see and to be seen afar off; the "king approved their sayings, adding pleasantly, that it should be so, and that he would bring his castle "thither, that is to say, enlarge it so far with two other wards, the charges whereof should be borne with "their two ransoms, as after it came to pass." The ransom of David was set at 100,000 marks, and that of John of France at three millions gold crowns, two of which crowns were to be equal to an English noble: the former being £66,666. 13s. 4d., and the latter £500,000. (about 10¼ millions present money), but he obtained only £155,000. (or about 2¾ millions). This writer attributes to the King of Scots' ransom, the erection in the second ward of the keep and two mighty towers with other buildings and walls (Winchester Tower excepted), and the higher ward to the King of France's ransom, which ward, indeed, as he writes, "Is that beauty and majesty of the whole castle." See also Stowe, *Harl. MS.* 367, f. 13, in Tighe & Davis, p. 165. Hollinshed, *Chron.* iii., 392. Lambarde, *Dict. Angl. Top.*, 4to., 1730.—W. P.

[118] 1361, 10 March. W. fuit superior operationum regis et prædictorem operum supervisorem constituit W. de W. ante dictum, ad eius dispositionem omnia regis ædificia tunc temporis erant peracta. Walcott, p. 17, *Harl. MS.* 6960, f. 47*b*, al. 92.—W. P.

[119] Of this inscription, "the earliest written narrative is given by Arch. Parker, *De Ant. Britt. Eccles.;* "Lowth rejects the anecdote as deserving but little attention, and standing upon no other foundation "than some popular tradition:" Tighe & Davis, *Annals of Windsor*, 1858, i., 174. Also in Camden, *Britannia*, p. 200, and in Philipott, *Villare Cant.*, fol. 1659, p. 379. It is mentioned (traditionally) as "on wall of Round Tower," 1680-84, by Dingley, *History from Marble*, published by the Camden Society, pl. 94 (111). It was perpetuated by Sir Jeffrey Wyatville.—W. P.

[120] Lowth, *Life of Wykeham*, 8vo, edit. 1777. Chandler, *Life*, 1775; and 12mo., 1842. Martyn, *Vita Wicchami*, lib. 1, c. 2, Oxford, 1690.—W. P.

[121] C. R. Cockerell, R.A., in his learned description of the Colleges, &c., in (British Archæological Association afterwards) Arch. Inst. of Great Britain, &c., "Winchester Proceedings," 8vo, 1846; and other writers.—W. P.

tectural attainments, because the learned herald Upton has written that it was one of those bearings which were carried "per carpentarios et domorum factores," *i.e.*, "by "carpenters and builders of houses." But another herald, equally learned (John of Guildford, 30-31), states that the chevron was usually given to the head of a new house or family when arms were granted, (the chevron, or rafter, being at the top of a house), and it was enlarged by one or two more chevrons, as the wealth of himself or of his heirs increased. The number of coats of arms of ecclesiastics, having chevrons, presents a good elucidation of the fact, as well as the number appertaining to those, to whom it has never been attempted to affix the title of architect or of carpenter.

In 1360, Wykeham[122] had been appointed Dean of St. Martin's-le-Grand, and continued so until some time in 1363, having been busy "rebuilding the cloister of the "chapter house and the body of the Church" in a very handsome manner and at a very

[122] The following Table shows the relation of Wykeham with the Officers and Works at Windsor Castle :—

History of Windsor Castle.	Life of Wykeham.
1327. Edward III. began to reign.	1324 (?). William of Wykeham born.
1327. John de l'Isle, Constable.	
1327. Ralph de la More, Clerk of the Works, at 2d. per day (? 2s.)	
.... Richard de Rotheley or Rochelle, Supervisor.	
1330. Thomas de Foxle, Constable.	1347 (?). Introduced to the King.
1349. Works begun.	1349. First benefice given to him.
1350. Rich. de Rotheley again Sup.	
1350. William de Hurle and William de Herland. John de Sponlee, master of the stone hewers.	
1351. John Brocas, Oliver de Burdeux and others, to survey workmen, &c., under James de Dorchester, deputy Constable appointed to control the works of the chapel, the materials and payments.	1352. Attorney to Bishop Edyngdon.
	1356. Appointed Clerk of the Works at Henle and Yeshamstead.
1351-53. Robert de Bernham, Sup.	
1356. Wyk. Supervisor of Works.	1356. ———
1358. Geoffrey de Carleton, Keeper of all the mason work, at 6d. per day.	1357. Increase of salary.
1358. Will. de Mulsho, Sup.	
1359. Wyk., Sup. at the Castle.	1359. ———
1359. Wyk., Constable and Sup. of the Castles of of Windsor, &c.	1359. ———
1359. Geoff. de Carleton, Keeper of all the mason work, and Chief mason at 6d. per day.	1360-63. Dean of S. Martin's-le-Grand.
1361. Will. de Mulsho, Clerk of the Works.	1361. Made an Acolyte.
1361. Richard la Vache, Const. for life.	1361. Fuit sup. oper. regis, &c.
1361. John de Ronceby, Controller.	1361-67. Queenborough Castle erected.
1362. Will. de Mulsho, Sup. again.	1361-8. Co-warden of Forests, south of the Trent.
1364. Nicholas Bernard, Sup.	
1365. Thomas Cheyne, Const. for life.	
1366. Adam de Hertyngdon succeeded Mulsho, as Clerk of the Works.	1367. Sept. 17. Appointed Bishop of Winchester.
1369. Helming Legatte or Legat, Constable for life.	
1370. Works finished—1375, a few others.	
1375. Robert Harresworth, Sup.	
1377. Richard II began to reign.	1379. College at Oxford begun.
1382. Arnald Brocas, Clerk of the Works.	1387. College at Winchester begun.
1389. Geoffrey Chaucer, Clerk of the Works at St. George's Chapel for a few months.	1394. Works at Winchester Cathedral commenced.
1390. Works at S. George's Chapel.	1403. Made his Will.
1399. Henry IV began to reign.	1404. Sept. 27 Wykeham. died. W. P.

great expense, but whether at his own cost or at that of the establishment is not clear. He also held, from 1361 to 1368, the co-wardenship of the forests on this side of the river Trent. Although, so early as 1349, the King had conferred the first benefice upon him, it appears that he could not take possession of the living, not being in orders; it was only in December 1361, twelve years later, that he was admitted to the degree of an Acolyte; it is, therefore, most probable, that the king gave him the office of clerk of the works at Henle and Yeshampstead[123] with that of supervisor in the same and in the following years [footnotes 91, 93, and 118], in order to afford him an income; indeed, this appears to be the true reason, from the patent of November, 1357, which, as before noticed, doubled his salary until he could obtain ecclesiastical preferment. In all the patents of appointments granted to Wykeham he is styled "clericus," hence many have presumed him then entitled to be considered a churchman; it was "a title addressed to academical "students," says Walcott (p. 7), one of his biographers; but this may be doubted, though it probably was applied to all educated persons, especially those who could write. Thus, it is affirmed that the word "clericus, often affixed to the names of witnesses in an early period, does not always signify a clergyman, for this was expressed by "persona," or if he was not beneficed, by "capellanus;" "clericus" seems commonly the person who wrote the instrument." (Hampson, *Medii Ævi Kal.*, 1841, i. 14). This is, however, a digression, but yet it was necessary to explain away the seeming force of the epithet.

From the often quoted year, 1361, Wykeham, however, was making rapid progress in the church, until he obtained, within the short period of six years, the bishopric of Winchester on the 17th September 1367. During these years Queenborough Castle was erected (1361, and finished in seven years, as generally stated) and it is traditionally ascribed to Wykeham as its designer; yet one author has named Henry Yevele, a mason, as the supervisor of it.[124] John Gibbon was "marmorarius" of the building, and the merit of the design is claimed for him. In 1370 Thomas Staple is called surveyor and also overseer there. As such works would necessarily in those days have entailed the personal supervision of the designer, I cannot but be strongly of opinion that Wykeham's thoughts and presence were of more importance (to himself) elsewhere, and therefore that he did not act as architect at its erection. He is also said to have been the originator of the Perpendicular style of Mediæval architecture, but as this assertion rests on the assumption of his having been an architect, the further consideration of this claim for Wykeham may be deferred to the time at which the origin of these periods of change shall be settled.[125] The College at Oxford, founded by Wykeham, was not commenced

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[123] 1356, 10 May. Rex dil. clico suo Willo de Wykeham salutem sciatis qd nos de fidelitate et circumspectione vris plenius confidentes assignavimus vos clicum oium opacoum nrarum quas in maneriis nris de Henle et Yeshampsted fieri ordinavimus, &c., as given in full in Walcott, p. 11, from *Harl. MS.* 6960, f. 29a.—W. P.

[124] For a very good account of this King's mason, by J. G. Nichols, F.S.A., see *Transactions* of the London and Middlesex Archæological Society for 1865; and *Gentleman's Magazine*, 1865, ii., 38.—W. P.

[125] "Shall we say that W. of Wykeham first introduced Perpendicular tracery, when we find every "one of its essentials in a window of the time of Edward I.? (Evington Church, Leicestershire, east window). "Shall we not rather conclude, that in their endeavours to arrive at perfection in tracery, the early

until the end of the year 1379, twelve years after Wykeham had been installed in the episcopal dignity; the College at Winchester was commenced eight years later still; and it was not until another seven years, namely 1394, that he decided to commence the reconstructions at Winchester Cathedral; in 1403 he made his Will, about fourteen months before his death in 1404. Another difficulty arising is that, supposing him to have been the architect of these buildings, we must then also decide that he was a "Freemason," and acquainted with those important secrets which we are all so anxious to re-discover! otherwise much that has been maintained as to the wonderful attainments of that band of skilful designers and workers falls to the ground. But I cannot suppose that he was one of the craft.[126] He has, too, the quasi honour of being twice mentioned in that very questionable list of Grand Masters of the Fraternity of Free and Accepted Masons, under the dates of 1357 and of 1377; the first, the year after he had been appointed supervisor; the second, before he had commenced his colleges. But some better evidence is still required that any bishops were ever made acquainted with their "secrets"; the contrary might be judged to be the case by those who have considered all that has been written respecting the celebrated Statute of Henry VI., which was passed for putting down the assemblies of masons. The fate of a German bishop must not be forgotten, who was killed by a master mason, because his son had been beguiled to betray, or had unwittingly betrayed, a secret to the bishop.[127] I am of opinion that Wykeham was not one of those initiated in masonic mysteries, and consequently, in this light, could not have been the designer of his colleges. Who then was the talented person? This portion of the enquiry has led me into a more extended field of research than I had at all anticipated; and the result is satisfactory only to a certain extent.

It has led me, nevertheless, to believe, that the Master Masons were generally the Architects during the Mediæval period in England. The Master of the Works may have been so, and probably the clerk of the works was so in the latest times. These two officials are referred to in this Paper.

The steps of the enquiry will, however, be best understood herein if explained

"builders in the course of their experiments, actually invented Perpendicular tracery, proceeded to a "partial development of its peculiarities, and finely rejected it as unworthy?" As stated by Brandon, *Analysis of Gothic Arch.*, 1849, p. 25. Edington Church, Wilts., 1352-61, has been cited as the earliest authenticated specimen of the Transition; it was erected by Bishop William of Edyngdon, who died in 1366, while carrying on his alterations at Winchester Cathedral. It is supposed that King Edward's work at Windsor was of the Decorated character. The southern side of the cloisters at Westminster Abbey was in hand 1355, 1358, and completed 1366, and "though of early Perpendicular work, it is of "superior character and very elegant in its mouldings," as expressed by G. G. Scott, R.A.. *Gleanings*, &c. The crypt of the church of St. John the Baptist, at Bristol, is of good Perpendicular work; the church was rebuilt 1357-74.—W. P.

[126] One of the best, if not the best, work relating to this subject is *The History of Freemasonry; its Antiquities, Symbols, Constitutions, Customs, &c., Derived from Official Sources*, by Robert Freke Gould, 4to, six volumes, 1882, &c. He has drawn largely from these papers here reprinted.—W. P.

[127] Bishop of Utrecht, 1099, obtained the "arcanum magisterium" of laying the foundation of a church, as stated in Beka, *De Episcopis Ultraject*; also in M. Leo, *Histoire Universelle*, cited by Kugler, *Histoire de l'Art*, p. 528, 1st edition; also Gwilt, *Encyclopædia of Architecture*, edit. 1876, p. 126.—W. P.

upwards. William of Wykeham, in his most carefully drawn Will (as quoted in note 96), declares that "the disposition and ordination," whatever those words may truly mean, "of the works at the Cathedral, be made by Master William Winford (or Wynneford), "(I have mentioned his name before,) and others sufficient, discreet, and approved persons "in the art, as may be deputed by my executors." But this is the first time Winford is mentioned, it may be said. Fortunately, he is almost the only exception I have found to a recurrence of a name! and furthermore, his portrait exists! In the stained glass of the College at Winchester,[128] may be seen the representations of three personages; first, the carpenter, whose name at present is lost to us; the second, our already known Williemus Wynfor, lathomus (or mason, a term to be explained on another occasion); and the third, Dns Simon Membury, who has not any office appended, but is also named in Wykeham's Will as the supervisor and paymaster of the cathedral works. I conceive that in William Wynfor we thus obtain the architect of the College at Winchester, as well as of the works at Winchester Cathedral.[129] Now for that at Oxford, which however is not so easy of proof; and I must beg leave for a little conjecture. The college was commenced, as before stated, in 1379. In a Roll of Expenses of the 44th year of King Edward III.,[130] under the date of 22nd April, 1370, it is recorded that William de Wynneford, plasterer (as the original word is translated, which, no doubt is "cementarius," or mason as it should be rendered), was sent to various parts to retain divers plasterers [i. e. masons] to be sent over in the retinue of the Lord the King beyond sea, by command of the chancellor, &c. It is not a little in my favour that the chancellor of this period was William of Wykeham himself. This Wynford then, was a mason of some position; an equal with Yevele, who was employed for the same purpose, and we know he was a mason by his works at Westminster Hall [footnote 124]. We may suppose Wynford to have been about 30 years of age or more when intrusted with this command, so that at the end of 33 years, when mentioned in Wykeham's Will, he would be at least 63 years of age, not too old to carry out the wishes of his patron. I should even venture to presume that both he and Yevele had been in the employ of the monarch at Windsor Castle;[131] but as the records of the period, and especially the accounts of the Castle are not abundant, no other mention has been found of his name; this early date of his employment, however, permits me to conjecture that Wykeham, appreciating his excellence, might have employed him at New College, Oxford. Some further research into such fabric accounts as may exist of all these buildings may elucidate this point, for no doubt the name of the master mason will be found recorded, as usual, in those documents. Lastly, as respects this part of my subject, a friend has reminded me of the observation made by Wicliffe in one of his sermons, probably written between the years 1366 and that of his death in

[128] Given in a woodcut by Winston (in Brit. Arch. Assoc., afterwards) Archæological Institute of Great Britain, &c. "Winchester Proceedings," 8vo. 1846.—W. P.

[129] Lowth, p. 195, states, Wykeham employed William Wynford as architect; Simon Membury as surveyor; and John Wayte, controller, &c.—W. P.

[130] Devon, *Brantingham Roll*, 4to, London, 1835.—W. P.

[131] Tighe & Davis, i., 186, give a reference to certain lands and houses at Windsor and elsewhere, given by the king to W. de Winford; orig. 46, Edward III., r. 21.—W. P.

1384, entitled, "Why poor Priests have no Benefices." It is only by inference, however, that the expression[132] used was applied to Wykeham, and considering all that I have brought forward, I am not disposed to believe that the cap fits his head.

MASTER-MASONS AND MASONS.

Omitting all mention of masons employed during the period previous to the Conquest, the only notice of them in the *eleventh century* is that of Robertus, cementarius, employed at Saint Alban's, 1077, who for his skill and labour, in which he is stated to have excelled all the masons of his time, had granted to him and his heirs, certain lands, and a house in the town. In the *twelfth century*, Arnold, a lay brother of Croyland Abbey, 1113, is designated "of the art of masonry a most scientific master." Of the employment of William of Sens (one of the "artificers" summoned by the monastery), a layman, and of William the Englishman (possibly a monk),[133] both engaged at Canterbury Cathedral, I need not say anything, except to add that the latter has been supposed the same as a certain William or Walter of Coventry, "one of the most renowned "architects in England," who is said to have designed Coventry Cathedral, 1187-99. I place here the lately discovered name of Gaufridus de Noiers alluded to by Bishop Hugh of Lincoln, as "nobilis fabricæ constructori," 1189-1200, of the chapel of St. John the Baptist, which was on the north side of Lincoln cathedral; and it is supposed the present choir is due to de Noiers; who is considered by Parker to have been of a Norman family settled in England.

At the commencement of the *thirteenth century* (about 1200), the Abbot of Saint Alban's assembled a "number of chosen cementarii, of whom M.[134] Hugo de Goldcliff was "the chief, a deceitful but clever workman (artifex)," as he is styled by the chronicler, who further states that "it happened by the design of the said Hugh, in addition to "stealth, fraud, impertinence, and above all, extravagance, before the average of the "work (the front wall of the abbey church) had risen to the boarded shed, the abbot "grew tired, weary, and timid, and the work languished—the walls were covered up for "the winter—they became fractured and fell with their own weight, so that the wreck "of images and flowers became the laughing stock of beholders. The workmen therefore "quitted in despair, nor did any wages reward their labours." Robertus, cementarius, ruled (rexit) the works at Salisbury Cathedral for twenty-five years from their commencement in 1217.[135] M. Albericus, in 1253, was paid for task work of the form pieces, that is, window tracery, probably for Westminster Abbey Church. John of

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[132] I have traced this application of the observation to Warton, who appears to have first used it in his *History of English Poetry*, first edit. 1774-81. It is quoted in Walcott, *William of Wykeham and his Colleges*, 8vo, 1852, p. 29.—W. P.

[133] For these two Williams, see Willis, *Canterbury Cathedral*, 8vo, Oxford, 1845. Also Ferrey, *Remarks upon the Works of the Early Mediæval Builders, &c.*, TRANSACTIONS, 1863-64, pp. 130-146.—W. P.

[134] "M." will designate those names found with the word "Magister" and "Master" prefixed to them.—W. P.

[135] See Elyas de Berham or Derham, previously under "Director" or "Master;" and Richard Davy de Farleigh, following.—W. P.

Gloucester, 1257-60, the king's mason, was rewarded, 1257-8, by Henry III., with his freedom for life from all tallage and tolls throughout the realm; he was employed at Guildford, on statues for St. Martin's Le Grand; also at Woodstock, Westminster, and Windsor. Robert de Beverley, mason, 1259-76, was engaged at the palace at Westminster, on a tomb at Windsor, on repairs at Westminster Hall, at the rebuilding of Westminster Abbey by Henry III., 1267-76, on works for the coronation of King Edward I., on the mews at Charing Cross, and on the king's kitchen garden; he received an annuity of sixpence per day, and became keeper of the works at Westminster. Walter Dixi, cementarius de Bernewelle, 1277, conveyed certain lands to his son Lawrence; the legend of his seal has "S' Walter le Masun," with a monogram.[136] Richard de Stow, cementarius, executed the Eleanor Cross at Lincoln, 1291-4, and was most probably the Stow who, 1306, contracted for the works of the tower at Lincoln Cathedral. William de Hibernia carved some of the sculpture for the crosses at Lincoln, Northampton, and Stoney Stratford; while John de Bello, or de la Bataille, cementarius, executed those at Stoney Stratford, Northampton, Woburn, Dunstable, and St. Alban's. That at Waltham was chiefly executed by Dymenge de Legeri, or Nicholas Dymenge de Reyns, as well as the Eleanor tomb at Lincoln. M. Michael of Canterbury, cementarius, worked on that at Westcheap in London, while that at Charing was begun by M. Richard de Crundale, cementarius (who executed the tomb in the abbey), and finished by M. Roger de Crundale, who supplied some marble for the tomb. William de Hoo, cementarius, was employed at the church of the Blackfriars, where a record of the queen was placed.[137] The above-mentioned Michael of Canterbury is no doubt the same mason who prepared the foundations in 1292 of the Royal (query St. Stephen's) Chapel at Westminster. Of this century, also, is the still existing incised grave-stone of Richard de Gaynisburgh, cementarius of Lincoln Cathedral.

During the *fourteenth century*, Henry, surnamed latomus from his trade, and carefully recorded as a monk, was largely employed at Evesham Abbey, and probably at St. Lawrence Church adjoining it. A contract, 1314, in French, all the former documents having been compiled in Latin, was taken by William Heose, "masoune," to erect a house of freestone; and another contract, 1321, enabled William de Keylesteds, mason, to pull down and rebuild Darley Hall, Derbyshire. Of this period are the well-known works at Ely Cathedral, carried out under the direction of John de Wisbeach and of Alan de Walsingham, both monks, as recorded earlier herein; but unless M. John Attgrene be the master mason, instead of the "bricklayer," as he is called by Bentham, we have not yet arrived at the name of that officer. M. Thomas of Canterbury, mason, began work in 1330 at St. Stephen's Chapel, Westminster. At Salisbury, in 1334, an agreement with Richard de Farleigh, builder, as he is designated in Dodwell, *History of the Cathedral* (who has not given the original word, but which it would be interesting to possess, as from what follows it is an early instance of the conjunction, apparently, of the designer and

[136] *Archæologia*, xxx, 19.—W. P.

[137] The accounts for these Crosses, cir. 1290, are printed in the *Archæologia*, vol. xxviii.; and by Roxburgh Club, by Turner, *Manners*, &c., 4to, 1841, p. 93-145.—W. P.

constructor), stipulates that he should be entrusted with the custody of the fabric, to order and do all necessary work in the same; and to superintend, direct, and appoint useful and faithful masons and plaisterers;[138] with regard to himself that he should perform useful and faithful work, and use circumspect diligence as well as provident discretion with regard to the artificers under him; that he should repair thither and make such stay as the necessity or nature of the fabric shall require; and that, notwithstanding his prior obligations at Bath and Reading, he should not neglect or delay the works of the church. This Farleigh most probably designed the upper storeys of the tower, with the spire. In 1394, when settlements appeared from the effect of these works, an agreement was made with Nicholas Portland, mason, conceived in the same general terms as those already cited. When further repairs were contemplated in 1415, a similar agreement was made with Robert Wayte, mason. Geffrey de Carleton, at Windsor Castle, in 1359, the same year that Wykeham was made constable and supervisor, had the appointments of chief mason and keeper of all the mason work. In the mention of the next name I avail myself of the words of the great historian who claimed to be a descendant. "In "this district of Kent," he writes, "and in the hundred and parish of Rolvenden, the "Gibbons were possessed of lands in the year 1326; and the elder branch of the same "family, without much increase or diminution of property, still adheres to its native soil. "Fourteen years after the first appearance of his name, John Gibbon is recorded as the "Marmorarius or architect of King Edward the Third: the strong and stately castle of "Queenborough,[139] which guarded the entrance of the Medway, was a monument of his "skill; and the grant of an hereditary toll on the passage from Sandwich to Stonar, in "the Isle of Thanet, is the reward of no vulgar artist." The result of an attempt to verify this statement induces me to believe that Gibbon most probably derived the information from documents in his own possession. M. William de Wynneford, called cementarius and also lathomus, 1370-1403, was employed for the King; and at Winchester College and Cathedral, by William of Wykeham. M. Henry de Yeveley, 1365-95, mason, was director of the king's works at the Palace of Westminster, and master mason at Westminster Abbey, 1388-95; he, together with Stephen Lote, executed the tomb of Queen Anne of Bohemia, still existing in Westminster Abbey. Robert de Skyllington, mason, 1392, is noticed as having hired men for works at Kenilworth Castle. Richard Washbourne and John Swalve, masons, 1395, contracted to raise the walls of Westminster Hall, and to carve and place the corbels to receive the carpenter's work of the present roof. The contract for the dormitory at Durham Cathedral was taken by John de Middleton, mason, 1398, and completed by Peter Dryng, 1401, who signed the second contract with Robert Daynwell and William Landes, also masons.

[138] I acknowledge the obliging assistance of Mr. P. W. Ottaway, who searched for the original document and found the endorsement to be "Conventiæ Richardi de Farleigh Lathomi," and in the body, "Richardi Davy (which two words are not quite clear, however) de Farleigh Cementarii,"—thus proving him, I consider, to have been the master mason and designer. The original words for "masons "and plaisterers" are "lathomi et cementarii," both terms, as noticed hereafter, meaning masons, as carvers and wallers.—W. P.

[139] Built about 1361-7, and claimed for William of Wykeham by his biographers. See page 205.—W. P.

In the *fifteenth century,* M. William Colchester was master mason at Westminster Abbey, 1399-1416, where he had at first only 100s. annual fee, raised afterwards to £10., "for ordering and surveying the works:" he was also master mason at York Cathedral, 1416-21, as will be mentioned presently. Thomas Hyndeley, 1416, cementarius, contracted for a portion of the cloisters at Durham; he there succeeded M. Thomas Mapilton, master mason, and obtained the stone for the lavatory therein, 1432; John Fethyrstanhalgh and other masons building the walls; Lawrence Latoner, of Newcastle, furnished the "spowtys" (which may have been of stone, if the surname "latoner" is mis-spelt for latomus, or, as has been suggested, they may have been of metal, if latoner is placed for latten-er); and William Sclater was employed for two days in "blaunching" or white-washing, probably cleaning down the whole work. Richard de Cracall, mason, 1412, contracted to rebuild Catterick Church, Yorkshire, in three years "new as "workmanship craft will." The bridge at the same place[140] was also taken, 1421-2, by Thomas Ampilforde, John Garett, and Robert Maunsell, masons; this was to be "made "sufficient and workmanly in masoncraft" for 260 marks (£173. 6s. 8d.) The contract for building Walberswick steeple, Suffolk, 1426, was signed by Richard Russell (or Rupel) of Dunwich, and Adam Powle of Blythburgh, masons, for 40 shillings and perquisites, for labour only, working but two terms in the year. At St. Alban's a tombstone records the death, 1430, of a "Latomus in arte," who was also esquire to Richard II. A second stone names another Latomus with the date 1490. John Wode, masoun, 1435, contracted for the labour of himself and servant in building the tower of the Abbey Church of St. Edmundsbury, "in all mannere of thinges that longe to free "masounry." William Horwode, "freemason," 1435, contracted to build Fotheringay Church, "by oversight of masters of the same craft," and "by oversight of master masons "of the country." It was from Benet, the mason, that William of Wyrcestre obtained the names of the mouldings of the doorway of St. Mary Redcliffe Church, Bristol. Robert Leget, or Legat, 1461-4, was chief mason at Windsor Castle, receiving 6d. per day. John Stowell, ffreemason, 1470, contracted to execute the "workmanshipp and "masonry crafte" of a frontal to an altar in St. Cuthbert's Church, Wells, for which he was to receive £40. William Orcheyerd, master mason, 1475-80, built by contract the greater portion of Magdalen College, Oxford. For St. George's Chapel, Windsor, Henry (or John) Jennings, or Jenyns, master mason, 1474-82, purchased the stone at the Tainton quarries in Oxfordshire; Thomas Cancellar being comptroller of the king's works, 1476-7, and he was also called clerk of the works, receiving £10, and with the chief mason and chief carpenter each had gowns. To this building Edward IV. in his Will refers, when he explicitly states that the chapel "begonne by us of newe to be "buylded bee thoroughly finished in all things as we have appointed it." In the erection of King's College Chapel, Cambridge, John Wulrich, master mason, 1476, was succeeded by John Wastell, about 1513, who, with Henry Semerk, one of the wardens of the work, contracted, 1513, for some of the vaulting. John Bell was a warden mason there.

[140] These contracts, for both church and bridge, are in English.—W. P.

Henry VI., besides providing in his Will for a clerk of the works, master mason, etc., carefully defines the dimensions and all the essential arrangements of his noble undertaking.

During the *sixteenth century*, Robert Jenyns, Robert Vertue, and John Lobins are called "ye kings iii Mr. Masons," about 1509, when estimating for a tomb for Henry VII. Robert Vertue built, 1501, a chamber in the Tower of London, and was paid for a "new "platt" at Greenwich. Master Estfeld, mason, in the reign of Henry VII., 1501, was paid for "a king's tomb at Windsor," £78. 3s. 2d.; the king's name is not given in the record, but it does state afterwards, by a payment of £10., that it was eventually removed to Westminster. Should the entries refer to a tomb for Henry VI. it would tend much to prove that his body was really removed to Westminster.[141] John Cole was "master "mason of the broach" of Louth Church, 1501-5, and towards the completion, it is stated that "Lawrence, mason, was paid 6s. 8d. for riding to his master in the north country "for to speer him whether he would make an end of the broach, and he said he would "deal no more with it, but he showed his counsel;" and William Walker, and Lawrence mason, were paid 2s. for "riding to Boston to speak with master mason to make an end "of the broach;" while William Lemyng and Christopher Scune are also recorded as master masons working there 1505-15. John Hylmer and William Vertue, freemasons, 1507, contracted to execute the groined vaulting to the choir of St. George's Chapel, Windsor, for £700.; and afterwards, 1512, Vertue assisted William Este to build Corpus Christi College, Oxford. This William Este, a freemason of Oxford, 1494, was engaged on works at Wodestock Hall. John Eastawe, or Estow, engaged, 1525-38, to "do all "manner of mason's work, bricklaying, and all other things concerning the masonry and "bricklaying, as well as the labourers concerning the same," in the erection of Hengrave Hall.

Christ Church College, Oxford, had the following officers at its erection, 1512-7 (a collection of whom is very rarely to be obtained), namely, M. Nicholas Townley, priest, master of the works; William Frere, purveyor of the works; M. David Griffits, priest, overseer of the workmen; M. Rowland Messenger, comptroller of the works; M. John Smith, auditor of the works; with Thomas Cowper and Philip Lenthall, his clerks, who were paid 66s. 8d. for their labour during the five years the college was being erected; John Adams was freemason; and Thomas Watlington warden of the carpenters.

The trades of Thomas Sellers and Nicholas Craven, who contracted, 1533, to rebuild the "hylings" of Burnley Church, Lancashire, for sixty pounds and a reward, are not mentioned—but it may be supposed they were masons. John Multon, or Morton, free-

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[141] Some authorities state that the body was removed to Westminster Abbey in 1501, at a cost of £500., the same year as the above-mentioned tomb; but this tomb is not known, and the body is supposed to be still at Windsor, and without a tomb. Gough, "*Sepulchral Monuments*," gives an engraving of a very elaborate design for a tomb for Henry VI., from a drawing in the Cottonian Collection [see diagram, page 241]. Knight in "*Old England*," gives a woodcut, No. 1216, vol. I, of a plain altar tomb and effigy of "Henry VI., formerly at Windsor;" it is also given in Knight's edition of Shakspere's Works. The opening of the vault will perhaps alone decide the point. Scott, *Gleanings*, &c., 8vo, 1863, p. 61, states, "we know that the body of Henry VI. still remains at Windsor, and that "neither the canonization nor removal ever took place."—W. P.

mason, had granted to him in 1536, by the prior and convent of Bath, the "office of "master of all their works commonly called fremasonry, when it should be vacant;" this is probably the same person noticed hereafter as employed at Hampton Court. At the building of Sandgate Castle, near Folkestone, 1540, one of King Henry VIII's castles, the list of officers noted is also very complete. The engineer was M. Stephen de Hashenperg, also known as Stephan the Almain, whose remuneration is not recorded, but from another document it was probably 4s. per day; Thomas Cockes and Richard Keys, commissioners, were paymasters, comptrollers, overseers, and surveyors,—for those titles are added indifferently to their names in the superscriptions, all most probably accepted as the same, and are without any payment named. John Lambert, clerk of the check, had 8d. for his daily pay; William Baker, overseer of the masons, had 6d.; Robert Lynsted, was master warden, or master mason; Nicholas Rychard, under-warden; Symond Stace, clerk of the store-house, had 6d.; Thomas Medley, overseer of the rockmen, 6d.; paymaster's clerk, 8d.; clerk of the receipts, 8d.; Thomas Bushe, clerk of the leger, 8d.: Stephen Warn, clerk of the call, 8d.; and Thomas Elgar, purveyor, 1s. The whole of the accounts were approved under the hand of Sir Walter Mildmay, then auditor to the king. Each week's accounts are signed by the chief persons above mentioned, with the mayor and jurats of the town of Dover.[142] And lastly, and this closes the list at 1543, when the townspeople of Coventry wanted their cross to be rebuilt, they contracted with Thomas Phillips of Bristol, freemason, and John Petit, of Wellingborough, to build it for the sum of £187. 6s. 8d., using "good sure seasonable "freestone of the quarries of Attilborough, or Rounton, in Warwickshire, or of both." More ought to be known of William Suthis, who "by art he was in masonry exquesit;" "he was master mason of Windsor Castle;" "a citizen and goldsmith of London," and died 5 Oct. 1625. All this is stated in an epitaph in Lambeth Church. He was succeeded at Windsor by N. Stone.

The information afforded by the Fabric Rolls, alluded to previously, of York Cathedral extends over a period so long that it has purposely been kept together, in order that the names and transactions shall be given in uninterrupted succession; and they are perhaps not too well known to be quoted, as greatly tending to elucidate the customs of the masons and their privileges. The name recorded of the first master mason is that of M. Thomas de Loudham, 8th Feb. 1347, when he was admitted and duly sworn to the office. M. Thomas de Patenham was his successor. A document, dated 1st Oct. 1351, declares that "on account of the skilful industry and labour of William de "Hoton (appointed Dec. 1350), son of M. William de Hoton, mason, employed and "hereafter to be employed about the fabric of our church," ten pounds of silver was given to him as a yearly pension, "together with a dwelling within the Close after the "death of his father, for the term of his life, provided only that he do not superintend "any other works, whereby our work might be omitted, neglected, or in any wise delayed. "If it should happen that he should be hindered by blindness, or any other calamitous

[142] These accounts, the originals, are in the British Museum, *Harl. MSS.*, Nos. 1647 and 1651. See Prof. Lewis, *Castles of Sandown, &c., and Sandgate*, referred to in Note 88, herein.—W. P.

"disease, from working or from directing the said work in a fitting manner, from that "time he shall pay yearly to the under-mason, who is the second master of the mason's "work, one-half of the salary of the aforesaid under-mason, out of his pension aforesaid. "If it shall happen through the negligence of the said William, while able to work and "superintend the said fabric, or through his voluntary omission, or through his occupa- "tion in other matters, that the work shall be neglected, omitted, or in any other matter "delayed, from thenceforth the aforesaid pension shall cease altogether, and the present "writing shall be wholly without force and effect." In 1355, "Orders for the Masons "and Workmen" were issued: "The first and second masons, who are called Masters of "the same, and the carpenters, shall make oath that they cause the ancient customs "underwritten to be faithfully observed. In summer, they are to begin to work imme- "diately after sunrise until the ringing of the bell of the Virgin Mary, then to breakfast "in the fabric 'lodge,' then one of the masters shall knock upon the door of the lodge, "and forthwith all are to return to work until noon. Between April and August, after "dinner, they shall sleep in the lodge, then work until the first bell for vespers, then sit "to drink till the end of the third bell, and return to work so long as they can see by "daylight. In winter, they are to begin work at daybreak and continue as before till "noon,—dine, and return to work till daylight is over. In winter, each mason is to "receive one day's less pay per week. When two feast days occur in a week, one day's "wages are to be forfeited, and when three feast days shall so fall, one-half week's wages. "On Vigils and on Saturdays they are to work until noon." The two masters and carpenters were to be present at each drinking time, to certify, for deduction of wages, all failures and absences. In 1367 and 1370 are contracts with the plumber for his services. In 1368 occurs a memorandum regarding the salary of M. Robert de Patryngton (magistro sementario), who, "for his good service rendered and to be rendered for the "term of his life, we (the Dean, etc.) have granted to him £10. a year, together with the "houses within the close which William de Hoton occupied, Provided that he shall well "and faithfully attend to the works, and shall not employ his time upon any other "operations. And if he shall undertake any works elsewhere, and apply himself to "them, neglecting, delaying, or leaving undone our works; and after being a third time "admonished on our behalf, shall not return to our works and diligently employ himself "about the same, then his salary shall cease until he shall return and duly make up for "his failures. If smitten with blindness or other bodily infirmity, whereby he may be "disabled from bestowing his bodily labour upon the said works, then, so long as the "infirmity shall continue, he shall receive 10 marks (£6. 13s. 4d.) yearly, together with "the houses aforesaid, bestowing his counsel and advice as far as he is able: In the "event of his being unwilling to labour, or withdrawing himself altogether from the "works, then our grant shall forthwith cease, until he shall fully return and attend to "our works." "Ordinances" for the masons were again issued in 1370, much to the same effect as those quoted for 1355; with these additions,—"that no mason shall be "received at work but he be first proved a week or more upon his well working, and "after that he is found conssissant of his work, he be received of the common assent of

"the master and the keepers of the work and of the master mason." In this year Patryngton was still master mason, having under him 35 masons and apprentices, and 18 labourers.[143] It was usual for this establishment to find tunics, (? gowns), aprons, gloves, and clogs, and to give occasional potation and remuneration for extra work. Gloves were also given to the carpenters. In 1398, M. Hugo Hedon was master mason, with 28 masons under him. In 1415 there are two entries, one recording the payment of £62. 8s. for eight masons working for the fabric for one year; the other of £52. for six masons: these appear to have been for special works at the cost of individuals. In that year M. William Colchester was master mason.

It was the general custom of the Chapter of York Cathedral to appoint the person who was next the head of the masons to the office of Master Mason whenever that office became vacant. The following letter, however, probably of the date of 1419, records an irregular transaction, but one of much interest in this enquiry. It states—"may your reverence "be pleased to know that certain stone-cutters, or masons, being moved by a most wicked "spirit of envy, wickedly conspiring for the death and ultimate destruction of M. William "Colchester (assigned to us and to the fabric of our church, by our most dread lord the "king, by his letters patent, for the government of the said fabric, and specially received "under the protection of the same), treacherously assaulting the said William, did "grievously wound him, and did so injure another person, his assistant, that his life is "considered in serious danger. Wherefore we most earnestly entreat that your brotherly "reverence, in whom we deservedly repose our entire and singular confidence, would "more clearly intimate to our aforesaid lord the king, and to others to whom and when "it shall seem expedient, the crime of the aforesaid persons; and if any persons, enemies "of the truth of Holy Church, or incorrectly informed, shall presume to show favour to "the aforesaid evil doers or their accomplices, you would be pleased to resist them by "deed and word, giving entire faith in this matter to the bearer of these presents." This victim of the malice of his fellow masons is the same William Colchester who was master mason at the building of the last portion of the nave of Westminster Abbey, from 1400 to 1415, when he appears to have been sent to York as thus shown.

In 1421 M. John Long was master mason; in 1423 William Waddeswyk was the guardian (warden?) or second master mason. In 1433 M. Thomas Pak was master mason; two "setters" had £1. 6s. 8d. given to them as remuneration; also two skins for aprons, according to custom, which cost 12d.; and ten pairs of gloves, given at the time of setting the stones, cost 18d. A nearly similar entry occurs in the following year. In 1442 M. John Bowde, or Bodde, was master mason; in 1456 M. John Porter; in 1466 M. Robert Spyllesby was appointed for the term of his life, and to be paid 3s. 4d. for every week he laboured for the fabric, also a salary of £1. 6s. 8d. (two months' pay) yearly, and he bound himself never to be absent without special license; while for such leave of absence his wages were not to be abridged. In 1470 is an entry of 3s. 4d.

[143] The masons were arranged according to their wages into seven classes: the first of fifteen had 3s. per week; 5 had 2s. 9d.; 1 had 2s. 7d.; 1 had 2s. 6d.; 4 had 2s. 4d.; 5 had 2s.; and 4 had 1s. 8d.; the wages of the labourers varied in the terms of 1s. 3d.; 1s. 4d.; 1s. 6d.; and 1s. 8d.; each, per week.—W. P.

paid to him for painting and gilding the chandelier; he had also to search for painters, probably in London; and to ride for the "marblers," which took him 28 days. He died in 1472, as another entry states that William Hyndeley, warden of the lodge of masons, was paid at the rate of 3s. 4d. per week for 28 weeks, for working in the office of the master of the masons, and had 13s. 4d. (one month's pay) for a reward. He became master mason, and two years later was working with 2 apprentices and 3 labourers—five years more, with 11 masons and two apprentices. He was succeeded on his death, in 1505, by Christopher Horne, one of the principal masons, who is mentioned as late as 1518. The cathedral, in all its essential parts, was finished in 1520. In the Fabric Roll of 1526 the master mason was M. John Forman, who with 13 masons, 2 apprentices, 1 intailer, and 17 labourers, were employed in the erection of the adjoining church of St. Michael le Belfrey; he remained in that office as late as 1535."[144]

For the reason before explained no references are submitted as to the portions of York cathedral which may have been the work of these Master Masons. The limits of the period, also, prescribed for this paper, precludes notices of the later Master Masons of the King's Works, whose names are occasionally found in those lists of the officers of the royal household, to which allusion was made in the previous portion.[145] The term Master Mason is now, perhaps, unfortunately for the art, nearly obsolete; but it till lately existed, at least in the establishment of the Corporation of the City of London. Richard de Wytham took his oath of office to the City of London in 1300. Thomas de Gloucester, mason of London, 1356, has been noted by Mr. R. F. Gould, *Freemasonry*, 1883, p. 342. Stephen Lote and Henry de Yeveley, above mentioned, 1395, were citizens and masons. As these notices refer to England solely, observations on the equally fertile ground of the Master Masons of Scotland have not been inserted; but it may be hoped that some of our members interested in that portion of the subject, will lay before the Institute the fruit of their researches.[146] I will only mention that the term "freemason" does not appear to have been used in that country at all. As to Ireland I must plead the want of knowledge of any information of importance, merely quoting in support, the words of a native essayist who has written,—"How often have "we, in exploring the ruins of the churches described, regretted the want of an "inscription to gratify the curiosity with which we have felt ourselves inspired"—as to the name of the fabricator.[147] The names I have mentioned must be accepted as a tithe of the hundreds that would be recovered if the authorities in possession of Fabric Rolls and other Building documents could be induced to publish them before they become illegible or be mislaid, as I fear is the case with some already.

The Customs, Remuneration, and Allowances.—These varied but slightly during the

[144] This long account is derived from Browne, *History of York Cathedral*, 4to, 1838-47; and *The Fabric Rolls of York Cathedral*, published by the Surtees Society, 1859, which rectifies some errors in the previous print.—W. P.

[145] Many of later date, with their buildings, will be found in my pamphlet, *The Renaissance and Italian Styles of Architecture in Great Britain, &c.*, 1450-1700, 8vo, 1883.—W. P.

[146] A large number will now be obtained in the work by Mr. Gould above mentioned.—W. P.

[147] T. Bell, *Essay on Gothic Architecture*, 8vo, Dublin, 1828, p. 254.—W. P.

period under consideration. All the money amounts have been given as named in the documents, no very satisfactory table having been made by which to compute their relative value in the present day. Probably the amounts in the fourteenth century may be multiplied from 15 to 20 times. Some comparison with the sums paid to the Masons will be afforded by the following:—1200-1400, the King's Knights had 2s. per day; an esquire, 1s.; 1313, a Scotch Bishop, while prisoner, 6d.; 1294, Edward I. allowed each monk of the alien priories 1s. 6d. per week; 1311, Edward II. granted 2s. per day to the Grand Master of the Templars, and 4d. per day to the Knights. The statutes in 1365 and 1414 enacted that no one should pay more than 5 marks per annum to any priest, and not above 2 marks for his gown, etc., nor above 8 marks to any parish priest; 1295, Gloucester allowed 2s. per day to each of its representatives in Parliament.

In the *thirteenth century*, about 1272, the mason at Westminster had 6d. a day granted to him for life by Henry III. The master mason at Ruddlan Castle, 1281, had 6d; the master carpenter, 1s.; the overseer of twenty, 6d.; their constable 8d., and their captain 8d. The workmanship of the Eleanor Crosses, 1291-4, was apparently contracted for by each separate tradesman. In the *fourteenth century*, the new works of the tower at Lincoln Cathedral, 1306, were to be paid for, the plain work by measure, but the fine carved work and images by the day. The mason assigned to superintend and direct, 1307, each of the works of building, and to be the master in the same office, at Westminster, the Mews, and the Tower of London, had 1s.; and under him there was a workman appointed to oversee the several operations of workmanship in all the above-named places; his pay, however, is not given, it being stated he was to receive it elsewhere. Two masons at St. Stephen's Chapel, 1319-20, had each 6d. At Caernarvon Castle, 1321, a man is paid 1s. per week for nine weeks for blowing a horn to call the workpeople to their labour. The master mason (or bricklayer, as the term is given, as before noticed) at the Lady Chapel, at Ely, 1321-49, had a stipend of 40s., a fur robe to cost 15s. 3d., 11s. 9d. for rent, as well as his board and wages. The master mason, 1330, at St. Stephen's Chapel had 1s.; two masons, each 5½d.; a mason's apprentice, 2d.; and the labourer for carrying the tools to the smith, cleaning out the lodge, and carrying stones, 3d. The chief mason at the Tower of London, 1336, and chief overseer of King Edward III.'s works, in all his castles south of the Trent, had a robe yearly, and 1s. per day. At the works at Westminster Abbey, 1350-3, the wages of two masons, on account of flesh time, were raised each 4d. a week more, that is 2s. per week. To one of them, as Master of the Work, 26s. 8d. over his wages were paid as a fee, and for his dress 13s. 4d.; for two pairs of shoes 3s., and to their boy 12d. In one year, as Sir G. G. Scott has told us, the chief mason would not receive his robe on account of the delay in its delivery.[148] In 1388 the chief mason's fee at the same place was £5, his dress and furs 15s.; another mason's was 13s. 4d.; and a third for a tunic 10s. The "master stone-"cutter," working on the stalls of St. Stephen's Chapel, 1358-9, had 1s. 6d. In 1359, the chief mason at Windsor Castle had 6d. per day. At Durham the master mason erecting the kitchen received £3. 6s. 8d. each quarter, and a robe worth 13s. 4d. For

[148] Transactions, 1859-60, p. 22.

the alterations made to Westminster Hall, 1395, the king supplied many of the materials, besides "herbergage," or lodgings for the masons and their companions, but neither the manual labour nor the tools. The "builder" of the tower and spire of Salisbury Cathedral, about 1334, was to have 6d. each day he was present, and 10 marks additional at the four quarterly terms, which salary was annexed to the office of guardian of the fabric, in case he survived the then "builder." At Exeter Cathedral, 1396-7, the free-mason had an annual salary of 26s. 8d. At Durham, the principal mason engaged, 1398, upon the dormitory, as "contractor," was to have a cloth gown each year, such as was worn by the prior's esquires, and daily a loaf of white bread, a gallon of ale, with a spitful of meat of the same quality as that prepared for the esquire's table; 40 pounds of silver was to be paid beforehand, and £40. for each six roods of work.

In the *fifteenth century*, besides those at York Cathedral already related, the following occur: At the cloisters at Durham, erected between 1408-19, the master masons were each paid £5. (£3. ?) 6s. 8d. per annum, with a garment at Christmas worth 13s. 4d.; the ordinary masons had 3s. 8d. per week in summer, and 3s. 4d. in winter. In 1432 a lavatory was erected in the cloisters, and the accounts show that "three pairs of gloves, "at 1½d. each, were given to the workmen." At the erection of Catterick Church, Yorkshire, 1412, the mason undertook to do his work for 8 score marks (£106. 13s. 4d.) in three years, and if finished by that time he was to have 10 marks (£6. 13s. 4d.) of money, and a gown which had been worn by the son of the client. The bridge at Catterick, 1412, was contracted for by three masons at a lump sum and a gown to each according to their degree; £20. was to be paid in hand. The labour in building Walberswick steeple, 1426, was undertaken for 40 shillings, with a cade of herrings and a gown of "lenore ones,"[149] each time of working. A parish in Suffolk, 1430, was to provide every freemason with a pair of white leather gloves and a white apron during the works. The mason, contractor for rebuilding in seven years the bell tower at Bury St. Edmund's, 1435, at £10. per annum, was to have board for himself in the convent hall, as a gentleman, and for his servant as a yeoman; also two robes, one for himself of gentleman's livery, that of the servant to be of yeoman's livery, or else to be paid 23s. 4d. in lieu of them. In the contracts for the Beauchamp Chapel, Warwick, 1447-57, the stone-work of the tomb only, by John Bourde, of Corfe Castle, marbler, was to be executed and fixed for £45. The contract for a Jesse front to an altar at Wells, 1470, was taken at £40.; 40s. were to be paid at the sealing of the contract, and 40s. weekly as the work went on, but leaving £5. in hand till it was finished: the contractor bound his heirs and executors by obligation in £20. should any of the covenants be broken. The master mason at the building of St. George's Chapel, Windsor, 1474 &c., had a gown; a few years later, 1482, the chief mason received £3. 6s. 8d. a year as a reward, a gown, and £12. per annum wages. By the Will of King Henry VI., 1447, the master mason was to be paid a yearly salary of £13. 6s. 8d. at Eton, and at Cambridge £16. 13s. 4d.; although about the same period, the master mason in the king's household was in receipt of 1s.

[149] As printed from the Contracts; but I suggest that "Leuere once," or "Livery once each time of "working," be the correct reading?—W. P.

per day, or £18. 5s. per annum.[150] At Wigtoft, in Lincolnshire, 1485-99, twelvepence "earnest money" was given to a workman on condition that "he shall take no other work "till we (the churchwardens) have done, without our leaves and consents."

As the contract, dated 1488, between the Prior of Durham and John Bell, mason, but endorsed "latimi," is a good example of such a document, the principal portion is here given without curtailment. It declares that "he is retained and sworn to serve the "said prior and chapter and other successors well and truly in his science of masonry "during his life; he shall be special mason to the said prior and chapter and their "successors, and all their works of masonry with imagery and other, new and old; and "to the good speed performing and ending of the said work shall give his due labour and "diligence, in his power, with his counsel, help, and bodily labour, and so far as pertaineth "to his craft, and after the wit and cunning given to him of Almighty God, without any "fraud, deceit, or male ingine, to be ministered and given faithfully as oft as he shall be "required thereto;—also he shall conceal the secrets and counsel of the said prior;— "from his occupation in due time he shall not depart without their special license; and "one young man *their apprentice*, to be hired for the term of ten years in the mason "craft, one after another, during his life, well and truly (he) shall teach and inform, to "his cunning and power without any fraud, &c.;—also he shall be obedient and buxom "to the aforesaid prior, &c., in all manner of things lawful and honest;—for the which "service, well and truly to be done and performed in form afore rehearsed, the said John "shall receive—yearly, during all the term of life that he may bodily perform all these "premises for great age or sickness, ten marcs (£6. 13s. 4d.) at four times of the year, "and every year at the Feast of St. Martin in winter, 10s. in money for his marte, to be "paid by the sacristan;—and yearly, one garment competent to his degree, and one "house ferme free to inhabit during his life, in the which house lived Thomas Barton, "mason;—also shall have one *apprentice of his own* for a term of ten years in the afore- "said mason craft, one after another during his life, to work and labour in the work of "masonry of the said prior, &c., for the which apprentice he shall receive of the sacristan, "—every year of the three first years of his prentice head, 4 marcs (£2. 13s. 4d.) and every "year of the three next, 6 marcs (£4.), and the ten and last year, 7 marcs (£4. 13s. 4d.), at "eight times of the year by equal portions;—and when it shall happen that the said "John have continual infirmities or great age, so that he may not work or labour, nor "exercise his craft and cunning, he shall then be content with 4 marcs yearly, to be paid "at eight times of the year by the sacristan. In witness hereof," &c. This is dated 1st April 1488.

During the *sixteenth century*, at the building of Hengrave Hall, 1525, the mason and all his company were to be boarded for 16d. per week; he was to be paid £200.—£10. when the foundations were begun, and "afterwards always as £20. worth of work was "wrought by estimation." At the erection of the spire of Louth Church, 1501, John

[150] This amount appears in later times to have become merely a fee of office; and to have been exclusive of a residence. The master masons attached to structures or corporate bodies, appear to have had a salary, and were likewise paid for the time they worked; several examples appear herein.—W. P.

Cole is mentioned as "master mason of the broach, making moulds to it by four days, "2s. 5d." Moulds are again recorded as being made, 1510, when the then master mason was paid 10s. for half a year's services, with 10s. in reward. About 1512, eight men, whose names are given, with other freemasons and setters, at Christ Church College, Oxford, had "xiid. in reward for their diligence in applying their labour in setting upon "the new tower at the east end of the new hall of the said College, on Saturday, after "their hour accustomed to leave work." Whilst the great hall at Hampton Court was in course of erection, in 1531, for King Henry VIII., John Molton (or Multon) was master mason at 1s. per day (he has already been mentioned as employed at Bath Abbey Church); Wm. Reynolds, warden, at 5s. per week; the setters had 3s. 6d. per week; lodgemen 3s. 4d. per week;—these may be presumed to have cut the moulded stones and ornaments;—of the hard hewers, some had 4s., others had 3s. 4d. per week. The more ornamental work, the "king's beastes," as they are called, the pendants, the crowned roses, &c., were executed specially by "karvers," at a certain price per set.[151] At Durham, in 1543, the two warden masons received 3s. 4d. per week each, the masons 2s. 8d., a warden quarryman 6d. per day, others 4d. It will be useful to add, that in 1610, "A "freemason which can draw his plot, work, and set accordingly, having charge over "others," was considered worth 12d. a day before Michaelmas, and 10d. after it. "A "rough mason which can take charge over others" was worth 10d. or 8d., according to those seasons.

It was lately observed by Professor Willis,[152] that at Westminster Abbey, in 1375, the king and the masons appear to have claimed the alternate holy days; on those falling to the King they worked and were paid; on those falling to the men no work was done, and of course there was no pay. It has already been stated how, at York, an allowance was to be made for certain feast days.

Workshop, Residence, or Lodge.—In 1200, the words "tabulatum domicialem," as the shed in front of St. Alban's Abbey Church whilst it was being rebuilt was called, may probably be an early intimation of such a building. If not, the entry, 1321, of 2s. 6d. for *straw* to cover the mason's lodging, at the building of Caernarvon Castle, may perhaps be accepted. In 1330, a man at St. Stephen's Chapel, Westminster, had, amongst his other work, to clean out the lodge.[153] The workmen at York Cathedral, 1335, were to breakfast, to dine, and such like, within the Fabric lodge; all the masons, 1370, were to be each day at noon "in the lodge that is ordained to the masons at work in the "close beside the church;" and, 1399, a list is given of "the stores in the loge in the "cemetery." In 1395, at the additions to Westminster Hall, the king engaged to find "herbergage" for the masons and their companions (journeymen?) for all the time they were employed on the works. In the same year, two carpenters were working upon

[151] Perhaps the best reference for these payments, &c., is the work by Mr. E. Law, *History of Hampton Court Palace*, 4to, 1885, who attempts to show who might have designed the additions made by King Henry VIII, other than the master mason. He gives a photograph of the first page of the book of payments.—W. P.

[152] Transactions, 1860-61, *Architectural History of Chichester Castle.*—W. P.

[153] Loge, Anglo-Norman; a lodge, habitation, lodging.—Wright, *Glossary to Chaucer's Poems.*—W. P.

the new house for the masons of Westminster Abbey, and another house in Tothill Street; and 15s. 6d. was paid to the "dauber" for the lodge for the masons and the house in Tothill Street. The earliest of the "Constitutions," circa 1400, to which reference will be made presently, has "If in the logge the apprentice were taken:" and, also in the words of this poet, whose name is unknown—

"The prevystye of the chamber telle he no mon,
Ny yn the logge whatsever they done,"—

a satisfactory statement of the concealment of trade mysteries. Another may also be considered in the entry of 1405-6, "One runnyng bar for the door of the lodge, 5d."[154] In 1421, at Catterick Church, a "luge of tre" was to be made for the masons to work in, specified to be of four rooms of "syelles" (principals?) and of two "henforkes" (lean-tos?). The masons engaged to build Walberswick steeple, 1426, were to be provided with "a 'hows' to work in, to eat and drink and to lay in, and to make 'mete' in "(fitting, convenient), to be built near the place of working." In 1432, a "loge" was erected in the cemetery garth at Durham. In 1470, a "warden of the lodge of "masons" at York Cathedral is mentioned. In 1529, an item occurs for "mending "and repairing old locks and hinges to serve for doors in Peckwater Inn, for the masons' "lodgings, xviii d. ob.;" "the tylying of iii hossys for the masons to work in;—the "tylying of iiii lodgys for the fremasons and for the brycke-hewers," occur in 1533; and lastly, in 1542-3, when Coventry Cross was to be built, the freemasons were at their own charges to procure, find, and make "an house or lodge for masons to work in" during the time of erecting the cross. The York Fabric Rolls already dwelt upon, have clearly shown what the masons had to do when in lodge; and, moreover, the manuscript Constitutions or Old Charges, referring to the subject of customs of trade, contain a provision that "no mason work moulds square or rule to any rough layers" (these commence as early as from the sixteenth century), or as it is expressed in one dating about 1670, "you shall not make any mould square or rule to mould stones withal, but such "as is allowed by the fraternity." The former codes also prescribe that "no mason set "no layers within a lodge or without to hew nor mould stone with a mould of his own "making;" but in the later manuscript this paragraph is wanting; whilst in the original manuscript *poem*, dating about 1400, and the original manuscript *history* (both shortly to be noticed) lately published, dating about 1500, there is nothing of the kind mentioned, but rather the reverse and exhibiting a more liberal spirit; as, "a cunning "mason, seeing his fellow at work," or, "working with him in his lodge," according to the later manuscript, "and at the point of spoiling the stone, he is to teach him how "to amend it, for love, and that the work of the lord be not lost." Into this lodge, the mason out of work is to be received, should there be employment for him; but if there be none, then money is to be given to him to help him to the workshop in the next town.[155]

Gilds and Companies.—When investigating in the first portion of this enquiry,

[154] Oliver, *Exeter*, p. 388.—W. P.

[155] As regards Scotland, Mr. Gould (ii, 403), gives the date 1491 as the earliest at which the word "lodge" is used.—W. P.

the meaning of the word "Supervisor," I endeavoured to establish an understanding that a large number of ecclesiastics and noblemen had no just claim to be considered as the architects of the buildings which were erected under their supervision. The application of this investigation to at least one well-known name (Wykeham) was not then accepted by those who held to the old opinions, founded, as was submitted, chiefly upon tradition and the misinterpretation of technical words. If, for what was then said, the execration of some four hundred Wykehamites has been promised, I may be permitted to fear the concentrated ire of some thousands of the members of that fellowship so well known in modern times, which availed itself of the name of Freemason, should I meddle with its history as usually received; but as I am now occasionally about to appear doing so, it is necessary to state that whenever the word "freemason" simply, occurs, it must be understood only to apply to the practical mason who worked freestone. The reason for this will be developed presently. Two instances of an early date have been put forward of so-called fraternities of masons. The first is, that Godfrey de Lucy, Bishop of Winchester, in 1202 formed a confraternity for repairing his church during the five years ensuing. Such, says Milner, was probably the origin of the Society of Freemasons. The second is, as asserted by Anderson,[156] but not authenticated since his work, that the Register of William Molart, Prior of Canterbury Cathedral, records that a respectable lodge of freemasons was held in that city in 1429, under the patronage of Henry Chichele, the Archbishop, at which were present Thomas Stapylton, master, the warden, fifteen fellowcrafts, and three entered apprentices.[157] After this investigation, I think some hesitation will be felt at receiving these statements to the extent intended by the previous writers, and conclude in both cases that the lodge, or whatever it may be called, is simply the staff formed to carry on the works at those cathedrals, as already shown existed at York; and quite distinct from the trade Gild or Company which might have been in existence in those towns at the same periods. The fact is, that each cathedral establishment had its own staff of permanent workmen, and "took on" additional hands whenever the edifice was to be added to, or to be rebuilt; I say rebuilt, because I have not met with any accounts of *restorations*. I have already explained that in the household of the Monarch was an office for carrying out royal works; and many of the king's masons have been mentioned herein. A Gild of Masons was undoubtedly in existence in London in 1375, 49th Edward III., when an enactment passed the whole assembled commonalty of the city of London, transferring the right of election of all the city dignitaries and officers, including members of Parliament, from the ward representatives to the trading companies; a few members of which were directed to be selected by the masters or wardens to attend Guildhall for election purposes. A list, drawn up in French, of the number of persons chosen by the

[156] In his *Constitutions of the Free and Accepted Masons*, 4to, 2nd. edit. 1738.—W. P.

[157] "William Molash, prior, 1428-38, celebrated for assisting in the re-edification of the cathedral, "and for his liberality and purity of conduct."—Woolnoth, *Canterbury*. Mr. Gould (ii, 304), states that "Among the Tanner MSS. in the Bodleian Library at Oxford, this register is extant. It contains no "mention of a lodge being held under Chichele, but it states that the 'lathomi' received livery. This is "no doubt the same entry—but more is founded on it than it will bear."—W. P

several mysteries to be the Common Council the next year, 1376, shows that the companies sending members were increased from thirty-two to forty-eight; they sent 148 members, or about an average of three a piece; the *masons* sent four members and the *free-masons* two members, thus establishing the fact of two societies. It is stated[158] that the freemasons were merged afterwards into the masons; the time of this amalgamation however, is not named, but it may perhaps have occurred between the above date of 1376 and of that of 1421-2, 9th Henry V., for in a document in the possession of the Brewers' Company, of that year, the *masons* stand 29th on a list of 112 companies, while the *free-masons* are not mentioned. Halliwell instances a single statement, that "a company of "under masons was formed in London 12 Edward IV.," 1473, fifty years after the date of the above-named list.[159] The incorporation of the Masons' Company in London is sometimes stated as having taken place as late as 1677 or 1678, but this date is without doubt the period when its charter was renewed by Charles II. That of 1411 is recorded in the usual subscription to the coat of arms—the grant of which is now in the British Museum—and it would accord with the supposed amalgamation above noticed. It is worth noting that Stowe, Seymour's *Stowe*, vol. ii., remarks, "They were formerly "called freemasons." I also find a notice of the "cementarii" gild in 1422 and 1423; and also that in 1501-2, the Masons' Company had then only eleven members.[158 and 159]

There are two curious coincidences connected with the before-mentioned date of 1375. The first is, that the earliest copy of the "History and Constitution," to which I have referred, and to which I shall presently refer, is in the writing of that period. The second, that some writers have considered it advisable to place at that date the origin of a wonderful society, caused, as they urge, by a combination of masons undertaking not to work without an advance of wages, at the time when they were summoned from several counties, by writs of Edward III., more especially to assist in rebuilding and enlarging Windsor Castle, under the supervisorship of William of Wykeham and others. Accordingly, it is said that the masons agreed on certain signs and tokens by which they might know one another, and assist each other against the then common custom of being impressed; and further agreed not to work unless free and on their own terms, especially as the monarch would not pay them so highly as did his subjects. There is probability about much of this, but, I believe, no authority. The earliest of such writs of impress in my notes is dated 1333, and the circumstance is perhaps sufficiently well known to render it unnecessary for me to recite any of them; but one exceptional document is worth mentioning, of about the date of 1353, it being a special protection given to the workmen, consisting of ten masons, ten carpenters, and their servants, engaged upon the erection of the church at Stratford-on-Avon, until the edifice be completed.

Statutes relating to Workmen.—These afford much valuable and hitherto unsought

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[158] Herbert, *History of the Twelve Great Livery Companies*, 1836-37.—W. P.

[159] A list, 1501-2, places the masons as No. 41 with eleven members; 8th Henry VIII., No. 31; 23rd Henry VIII., No. 40; 1603-4, No. 40: Jupp, *Carpenters' Company*, pp. 290-4.—W. P.

[160] Sharon Turner, *History of the Anglo Saxons*, 1799, vol. iii, gives an interesting chapter on the Gilds of that period. There are also several books on the subject written within a few years.—W. P.

for matter in this branch of the enquiry. The Statute of 1349, 23 Edward III., states that "a great part of the people and especially of workmen and servants late died of "the pestilence, whereby many demand excessive wages and will not work;"—the hours of labour were therefore settled, because "that diverse artificers and labourers retained to "work and serve, waste much part of the day and deserve not their wages, some time "in late coming unto their work, early departing thereof, long sitting at their breakfast, "at their dinner, and noon-meat, and long time of sleeping at afternoon, to the loss and "hurt of such persons as retained them in their service." The statute of 1530-1 (only the next year) complains that, "to their ease and singular covetise, (they) do withdraw "themselves to serve (from serving?) great men and others, unless they have livery and "wages to the double or treble of that they were wont." Their wages were then settled. In 1360-1, 34 Edward III., the statute declares that "carpenters and masons and all "other labourers shall take from henceforth wages by the day and not by the week, "nor in any other manner." It would thus almost appear that not only the architects of the present day had gone back to the mediæval times, but the master builders as well; and the workmen, to retaliate, having struck in a very modern fashion, the statute continues, "that all alliances and covines of masons and carpenters, (both "trades, it will be noticed,) and congregations, chapters, ordinances and oaths betwixt "them made or to be made, shall be from henceforth void and wholly annulled, so that "every mason and carpenter of what condition that he be, shall be compelled by his "master to whom he serveth, to do every work that to him pertaineth to do, or of free "stone or of rough stone; and also every carpenter in his degree; but it shall be lawful "to every lord or other to make bargain or covenant of their work in gross, so that "they perform such works well and lawfully according to the bargain or covenant with "them thereof made." I believe I am correct in stating that this important statute has been hitherto overlooked; it was, however, enforced by others dated 1368, 1378, 1414, 1423, and by the well-known statute of the 3rd Henry VI., 1425, again putting down all chapters and congregations held by masons (this time it is the masons only). This last Act was passed at the "special request of the Commons." This special request may be found in the printed Rolls of Parliament, otherwise it has never been reprinted. Again, in 1436-7, 15th Henry VI., another statute was required to correct the "masters, "wardens and people of the guilds, fraternities, and other companies incorporate, dwelling "in divers parts of the realm, who make among themselves many unlawful and unreason-"able ordinances, as well of many such things whereof the cognizance, punishment, and "correction all only pertaineth to the king, lords of franchises, and other persons,—and "made for their singular profit and common damage to the people." All such wardens are to bring their letters patent to the justices and others where such gilds, fraternities, and companies be, for their approval. In 1503-4, it was declared that no ordinance is to made or enforced without the approbation of the Chancellor. Again, in 1530-1, the complaint was still that the masters and others "have by cautell and subtil measures "compassed and practized to defraud and delude the good and wholesome statutes: and "have made acts and ordinances that apprentices shall pay," so much, "after their own

" sinister mind and pleasure, contrary to the meaning of the acts aforesaid." In 1548, the complaint was, that "artificers, handicraftsmen, and labourers had made confederacies " not to meddle with one another's work, but had decided how much they would do in a " day, and what hours and what times they would work, contrary to the laws, to the " great hurt and impoverishment of the King's Majesty's subjects." These statutes were of course superseded by the well-known statute of 5th Elizabeth, 1562-3, which continued in force until so late as 1813, when that portion was repealed which empowered justices to rate the wages of artificers and labourers. In 1814, so much was repealed as forbade exercise of trades by persons not having served, and as regulated the mode of binding, &c., but at the same time the customs and privileges of cities and boroughs were saved.

It is certain, from all these observations, that there were fellowships or gilds of masons existing before the middle of the fourteenth century, but whether the one in London had any communication with other gilds then existing in the other Corporate towns, or whether there was a supreme gild which led to a systematic working, is still without elucidation (1887). All the documents, the contents of which have been detailed herein, have led me to believe that there was not any supreme gild in England, however probable the existence of such a body may appear. Thus the " orders," supplied to the masons at work at York Cathedral in 1355, give but a poor notion of there being then existing in that city anything like a gild or fellowship claiming authority in virtue of a charter, supposed to have been given to it by Athelstan in 926, not only over that city but over all England. In Germany, it may be mentioned, it is clearly ascertained that the well known Grand Lodge of Masons of that country was not formed until so late as 1452. Herbert in his *History*, before quoted, states as follows :—

" The charters of Edward III. and his grandson Richard, distinctly point out the " reasons of reconstituting the trading fraternities, as well as the principles upon which they " had been primarily established. We learn from them that the whole of these societies " were, at first, associations of persons, actually and not nominally, professing the trades " from which they took denomination ; and that, existing on a principle of general sub- " scription, they not only possessed an equal share in all rights which themselves had not " chosen to delegate, but that all of them when 'full brothers' equally participated in " whatever advantages accrued to such societies, whether of property or privilege ; all in " necessity could claim to be relieved in proportion to the fraternity's funds ; and in cases " of insolvency at death, the funerals of poor members were, by their ordinances, to be " equally respected with those of the rich. Finally, elections of officers were by and from " the assembled commonalty." . . . " The charters, moreover, furnish abundant information " on other points, . . . as, the sort of authority in which the guilds existed before such grants " were made ; their then number and denominations of officers ; and the way in which " they regulated and governed themselves. The privileges granted are, as to general " meetings, 'that they may have and hold their guild once a year,' and may in the same " 'settle and govern their mysteries ;' they may choose 'honest, lawful and sufficient men,' " best skilled therein, as their officers, to enquire of the concerns of their trades, or correct

"and amend the same; they also confirm the ancient right of search through their "respective trades, in order that each of them may detect dishonest practices in his own "craft and punish offenders, subject to the cognizance, or, as it is termed, view of the "Mayor."[161]

Legendary History.—In addition to this intelligible account of the object of the Charters of Incorporation, it may be added that some of these companies or gilds had legendary histories of their trades.[162] I have already referred to this subject, and as forming a portion, I think a valuable portion, of this enquiry, I may be pardoned for dwelling somewhat on it.[163] That of the masons generally commences with the period of "King David, who loved masons well;" but some copies are over-particular, and commence before the Flood. After relating the institution of Geometry in Egypt, it is brought rapidly down, fortunately so, to Charles Martel (this was a French tradition), to St. Alban, and to an assembly held in the year 926 by Athelstan and his son, or brother, Edwin; the later copies claim the city of York as the place of congress. Of such Histories and Constitutions there are five in manuscript in the British Museum; one has belonged to a Chester gild and is dated 1646, one 1659, and the others are probably of the same century; another, in my possession, is not earlier than 1714. They all bear evidence not only of being copies of some earlier documents, but of the copyists not being versed in what they were transcribing. At least four others of the same description have been printed from various sources, during the last and present centuries,[164] and the same legend is claimed by the present Society of "Free and Accepted Masons." Besides all these, there are also in the British Museum two ancient copies, written on parchment and in English. The earlier of the two, presumed to date about 1400, is presented as a poem, consisting of about 575 lines, and was apparently composed by a priest, probably the secretary to the lodge or company; and as it may be presumed to have been written for public benefit (of those who could read, by the way), nothing very mysterious could have been then considered as appertaining to such a history. This copy of the "Con-"stitutions of Geometry" (or Masonry), for none of them say "Freemasonry," was first noticed by Mr. J. O. Halliwell.[165] The other ancient manuscript, dating early fifteenth

[161] This subject has been treated very thoroughly by Mr. Gould, ii, 328-380.—W. P.

[162] "By no other craft in Great Britain has documentary evidence been furnished of its having "claimed at any time a legendary or traditional history;" Gould, *Freemasonry*, 1882, i, 57.—W. P.

[163] Mr. Gould writes (i, p. 57), "The British Constitutions, or 'Old Charges' have indeed neither pre-"decessors nor rivals, and their peculiar characteristics will be found, in truth, to amply warrant detailed "examination."—W. P.

[164] A good specimen of one is given in the *Gentleman's Magazine*, June, 1815, part I, p. 489. Since this was written, fifty-one copies and references altogether have been traced; as shown in Gould, *Freemasonry*, 4to, 1882, p. 77, &c., where each one is criticised and described; see also in 1884, iii, 194. No two copies are exactly alike (i, 59).—W. P.

[165] This poem, by an unknown writer, is a version of the "Old Charges," and is ascribed, according to well-known authorities, "to the XIV century;" "not later than the latter part of the XIV century;" "the middle of XV century;" and "between 1427 and 1445." Mr. Gould places it in "XIV century," and No. 1 of his list of fifty-one examples of such documents: p. 60 and 70, of his *History*. It was published by J. O. Halliwell, *Early History of Freemasonry in England*, 8vo, 1840, and again 1844; he having brought it before the Society of Antiquaries in Session 1838-39. "The legend of the craft will

century, was only received into the Museum Library in October 1859; it was printed shortly after (12mo., 1861) nearly in facsimile, being edited by the late Matthew Cooke, a zealous member of the Grand Lodge. I cannot here attempt to discuss all the characteristic qualities of the regulations and by-laws, as they may be termed; it will therefore now be only necessary to state that they were undoubtedly compiled for the use of a body of working masons; that they refer to the "yearly assemblies"[166] (of some companies or gilds, I consider), and no doubt these are the meetings aimed at by the statutes; to a lodge as a workshop; directing "the most cunning to be governor of the work and to "be called master;" taking of apprentices; workmanship; brotherly love; moral conduct; punishment of offenders; and observance of their "articles and points," or by-laws as they may be termed, many of which appear very similar to the precepts contained in the indentures of apprentices of the last century. These Ordinances or By-laws of the Masons can now be compared with those of the Carpenters, dating 1486-7 and 1607, which are printed in Mr. W. W. Pocock's recent (1887) edition of Jupp's *Historical Account of the Company of Carpenters.* This work, p. 364, specially refers to the marks which were made (1569) to certain documents by those who could not write. There are not, in the masons' ordinances, any references to secret signs (in Germany these are not supposed to have been used until 1452); or to masons' marks—monograms, as they might be properly called.

Marks.—Upon this question, though probably it will be said by some that I know nothing about the matter, I consider, with others, that whilst such marks as were made by the ancient masons often took the place of a proper sign manual to a document, they then, as now, when placed on a stone, merely designated, or designate, the stone which each man worked. Occasionally a double mark is observable, one being supposed to be that of the foreman under whom the mason worked, the other that of the workman himself. Thus by these marks, in case of wrong or defective workmanship, the mason who had to make his work good could at once be known. From a few observations recently made, it has been ascertained that a series of similar marks are found upon buildings erected within a short distance of each other, probably proving the employment of the same set of workmen at each place. The Lady Chapel of Ely Cathedral, and St. Stephen's Chapel, Westminster, were contemporaneous buildings, and may offer a reliable instance where some of the workmen were engaged upon both structures.[167] To refer to other trades, the carpenters (as above noticed) used marks down to as late as 1597; while the Coopers' Company, in 1758, issued particular marks to the members of their trade. Merchants' marks are well known to have existed during the Mediæval period, if not equally employed by them now; and rarely can a black-letter book be opened without one or two belonging to the author or printer being seen.

Designations in Trade.—Having thus described most of the important features

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"(by this) be carried back to the time of Henry III., beyond which, in our present state of knowledge, "it is impossible to penetrate;" Gould, iii, 219.—W. P.

[166] See Gould, *Freemasonry*, iii, 55.—W. P.

[167] This subject has been elaborated by Gould, *Freemasonry*, 1883, ii, 455-466.—W. P.

connected with the masons and their trade, their "designations" will now be noticed, as the titles exhibit some peculiarities that do not appear to be easy of explanation. It may perhaps be a matter of surprise that this was not attempted in the early portion of the Paper, but it was desirable to keep all the designations together, and some of them were necessarily reserved for the conclusion. That these Mediæval terms have not been clearly comprehended, may be gathered from an amusing quotation, where Richard of Wolveston, cited as a "prudens architectus" in a register of the period of Bishop Pudsey of Durham, early in the twelfth century, is, in a charter relating to an exchange of lands, styled "ingeniator;"[168] and the translator, commenting upon the term, writes, "Dick the Snarer (which would now, however applicable, be rather an awkward com-"pliment to a bishop's gamekeeper) was then doubtless a title of honour—a gin is still, "I think," he continues, "technically called an engine or ingene." Another exponent of the same document demonstrates that "this surname (ingeniator) was not uncommon in the "north of England at the period, and was applied to any person who manifested genius "in his vocation." However this may be, it was gratifying to meet with the conjunction of these words "architectus" and "ingeniator," as in the first edition of Paper but few instances of the application of the latter term could be given, although it was the one of which earliest mention was found. "Caementarius" occurs 1077, and is the term most constantly in use. "Artifices" were collected at Canterbury to a consultation, from which William of Sens came out the "Magister," a term also applied to his successor William the Englishman; but it is not clear whether "master of the work" or "master "mason" is to be applied to these two. In 1217, a popular educational writer noted the word "cementarii" together with the old French synonym "maszun," leaving little hesitation for our accepting the one for the other.[169] The London Assize of 1212, besides "cementarii," has "sculptores lapidum liberorum," words of very exceptional use.[170] "Artifices" were also assembled to a consultation at the commencement of the building of Westminster Abbey. At the end of the *thirteenth* and beginning of the *fourteenth* centuries, the terms "magister cementarii," with his "sociis," or fellows, are obtained; "marmorarius" has been noted; also a new word "latomus," which is after that period found written in all manner of spellings. Latomus is used in an inscription in Paris as early as 1257. A "masoune," in old French, is to erect a house "de pere fraunche;" and of a somewhat later date is found a "mestre "mason de franche pere;" while still later, 1360, a mason "de fraunche pere ou de "grosse pere" appears in the statutes. In a writ of 1415 are the words "petras vocatas "ragge calces et liberas petras." During the *fourteenth* century, "lathomus" is constantly found, and it would appear to be applied not only to the mason who was to

[168] See page 186 of this Paper, under *Architect and Ingeniator*.—W. P.

[169] See page 230, footnote 173.—W. P.

[170] "France petre," applied to Reygate stone, occurs 37 Henry III., 1253, in the Fabric Rolls of Westminster Abbey. While "freestone" is given as the equivalent of some Latin word, 43 Henry III., 1258-9, by Devon, *Issues*, &c., 1837, p. 44-47, and later. The cementarii above mentioned, had 3d. and their food per day, or 4½d. without food; the sculptores had 2d. and 4d. per day.—W. P.

execute cut-work, but to the mason who was required for rougher work, and to labour at the quarry. Under the date of 1396 the contractors for works at Westminster Hall were "citiens et masons de Londres;" and of the same year is the passage "lathomos "vocatos ffremaceons," and "lathomos vocatos ligiers," or as we should translate the words, masons called free (stone) masons and masons (the same term is used for both) called layers or setters.[171] "Simentarius" before, and "fremason" after, 1396, are found in the Fabric Rolls of Exeter Cathedral. These entries show the use of the latter term in Kent and Devonshire at the same period. As remarked earlier herein, "lathomus" is appended to William de Wynneford's portrait at Winchester College; and somewhat later, amongst the "latimi" at Durham, one is specifically called a "ffremason." In 1419, a mason is directed to take "lathomos" and other artificers and labourers to make carriages for cannons. A writ, 1421, is for carpenters, lathomos, smiths, &c., for Rochester Castle. 1425, corbel stones for Burcester Priory are worked by the latamo. Two masons, 1426, took the contract for Walberswick steeple. John Wode, mason, contracted, 1435, for repairs at Bury St. Edmund's; and in the same year, fremason is the term used, with rough setters and layers in the contract for Fotheringay Church. A "latomus in arte" occurs on a tombstone 1430 at St. Albans. The "Account "Book" for All Souls' College, Oxford, 1441, is headed "pro expensis lathomiorum." The master mason, 1440, at Eton College is to take masons as necessary; a mason is to take carriage and other necessaries; while a warden of masons is to take workmen, labourers, and carriage, as shall be necessary in the craft. The Statute of 1444-5 refers to a frank mason or master carpenter, a rough mason and a meme (mesne) carpenter. 1464, a "serjeaunt of the King's masonrye" within the realm of England is exempted in an Act of Resumption. 1470, a "ffreemason" contracted for ornamental work at Wells. Freestone and freemason are words used by William of Wyrcestre. In 1485-8 a freemason made a cross in the church yard, and a mason did sundry work at Wigtoft, Lincolnshire. At Durham, a contract, 1488, made in English, for retaining the services of a mason, is headed "latimi." A freemason of Oxford executed work at Woodstock in 1494-9. Mason is the word generally used in the Privy purse expenses of the Kings Henry VII. and VIII.; also master mason at Windsor—freemason for making images. In the Statute of 1495, the words are freemason, master carpenter, rough mason, bricklayer (for the first time), &c. The same words are used in those of 1515 and 1548, while the Act of 5 Elizabeth, 1562-63, classes them all under the title of artificers and labourers. No later examples need be given, for thereafter mason and freemason are terms in constant use down to the present time.

From these details three facts are obtained; the first, that the earliest use of the English term freemason was in 1396,[172] without any previous Latin word. The second

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[171] This was first obtained by me from Rymer, *Fœdera*, edit. 1717, vol. xvii, p. 55 after the index; the deed, dated 14 June, 19 Richard II. is from a copy of the original document in the Sloane MSS., No. 4595, p. 50. It is given in full in Gould, *Freemasonry*, iii, 157, the reference having been supplied by me for the purpose.—W. P.

[172] Mr. Gould notices that the word "Freemason" occurs in the list of Companies, 1376-77.—W. P.

is, that the word freestone, or its equivalent Latin term, had been employed from the beginning of the previous century, *i. e.* 1212;[173] and the third fact, if that word be permitted me, is that the term freemason itself is clearly derived from a mason who worked freestone, in contradistinction to the mason who was employed in rough work. This may appear to many a trivial point, but those who know the many fanciful origins of it so often quoted, will perhaps accept this solution; one which has been suggested before, without any proof brought forward in support of it.[174] Besides these, two other terms of trade have been employed to which it may be supposed there would have been many references; the one is "magister lapicida," the other "liberi muratores." Such designations have nowhere been met by me in documents relating to England; and thus, I think, there is not sufficient authority for that constant use of them observable in writers of former years.

Bridge Builders.—There is yet another designation upon which much has been written, especially during the last 100 years, namely, the "Fratres Pontis," a brotherhood that, more especially in France, is said to have been founded for the express purpose of travelling far and wide to build bridges. Even as regards that country I have only found a notice of such a troop having been formed at the building of the bridge at Avignon, and of that of St. Esprit, over the Rhone, during the twelfth and fourteenth centuries (1178-88 and 1265-1309). Not much surprise will therefore be felt when it is stated, as regards England, that amongst the numerous references in my notes concerning bridge building specially, no intimation of any such institution appears. The nearest approach to such a society is referred to in the reign of Henry II., 1154-89. Its history is, that a burgess of Gloucester gave a piece of land to the founder (or builder as he is termed) of the West Gate bridge—erected a house upon it for the convenience of the workmen—retired to it himself with several other persons of both sexes—assumed a religious dress— and lived upon the charity of well disposed persons; an incorporation was made by Henry III. in 1229; and a charter granted by Henry IV., in 1408, for the better endowment of the hospital. But this differs much from the often lauded proceedings of the bridge building fraternity. This bridge was pulled down and rebuilt of one arch 87 feet span by Sir Robert Smirke.[175] I have also to add

[173] In the "Vocabularies" edited by T. Wright, F.S.A., 1857, are the following explanation of these and other terms:—In the eleventh century, Cimentum, andweorc to wealle; Cimentarius, weal wyrhta; twelfth century, Cimentum, andweorc to walle; Cemen. . . . . hta; fourteenth century, Latamus, mason; Cementarius, dawber; fifteenth century, Latamus, mason; Simentarius, idem est. Also first half of thirteenth century, Calce lathomi (chalk stone?); Lathomega, a rule; fifteenth century, Latomega, a mason ax; fifteenth century, Petro, a chyp of a stone; Timeria, fre stone. In the Durham accounts I found "iii latomers," apparently meaning three hammers, or tools of some kind.—W. P.

[174] Lyon, *History of the Lodge of Edinburgh*, p. 80, declares that the reference to "frie mesones" in Dec. 27, 1636, is the earliest instance yet discovered of Free-mason being in Scotland applied to designate members of the mason craft, and considers that it is used as an abbreviation of the term Freemen-masons. Gould, ii, 407, 409, concurs with him. The earliest use in Scotland of "freemason" may be traced back to 1581. Mr. Gould (ii, 403) gives 1491 as the earliest use of the word "lodge" in connection with the Scottish craft.—W. P.

[175] For several references to Mediæval bridge building, see Gould, *Freemasonry*, ii, 294-5.—W. P.

that M. Grégoire, in his carefully written history of this brotherhood, could only refer to the bridge over the Dee, and another over the Eden, and those on the authority of the "Annual Register" for 1808.

Probably some of the readers of this Paper will have expected from me an account of those "Travelling bodies of Freemasons" who are said to have erected all the great buildings of Europe; nothing more, however, is to be here noted than that I believe they never existed. The earliest mention of them appears to have been promulgated by Aubrey, at least before 1686, who cited Sir William Dugdale as having told him "many years since that, about Henry the Third's time (1216-72), the Pope gave a bull "or patents to a company of Italian Freemasons to travel up and down over all Europe "to build churches. From those are derived the Fraternity of Adopted Masons." This statement has been "adopted" by many writers on the faith of those two respectable authorities, but no other evidence adduced in support of it. On the contrary, Governor Pownall has himself recorded that with the best assistance he searched for some such papal rescript or document in the Vatican Library without success; this was a few years before 1788, the date of his communication to the Society of Antiquaries. The account relating to these personages, as given in the "Parentalia," and generally attributed to Sir Christopher Wren, though prefixed with the words "he was of opinion," is to the same purport, though somewhat enlarged; and it may be presumed it was obtained from the same source. The careful historian of Scotland, Patrick Fraser Tytler, on the contrary, has written,—"I have in vain looked for the original authorities "upon which Sir C. Wren and Governor Pownall have founded this description of the "travelling corporations of Roman architects." It will not be a matter of further surprise at the want of success of both Pownall and Tytler, when it is stated that, from a comparison of circumstances, Dugdale's information most probably referred to the "Letters of Indulgence" of Pope Nicholas III. in 1278, and to those of other Popes as late as the fourteenth century, granted to the lodge of masons working at Strassburg Cathedral. If this be correct, it clears up a long debated point, and, I fear, does away with some more of the romance attached to this interesting subject.

It is a very noteworthy fact, that the Master Mason, though obtained occasionally on the spot, appears to have been sought for in some distant locality, similarly to the architects of the present day. Besides what the documents at Salisbury prove, there is one remarkable instance of this which I have not stated. A cementarius, named Durandus, employed from 1214 to 1251 upon Rouen Cathedral, is known to have been sent for by the Abbot of Beaulieu,[176] in Hampshire, and that he came over, is presumed from the circumstance that it required the king's authority to release 21 burellos[177]

[176] Monastery founded in 1204 by King John.—W.P.

[177] Borel, a woven cloth, two ells wide from list to list, temp. Henry III. A coarse cloth of a brown colour. Buriel, Lion tawny, a colour between black and red. Kersey is a coarse cloth; Connelly, *Dictionary*.—W. P.

belonging to Durandus, which were detained at Southampton. Many of the master masons appear to have realised property, and to have had lands at their disposal; they appear to have insisted upon comfortable habitations while at work, to say nothing of the donation of a gown, furred or otherwise, a practice which has been noticed as occurring early in the fourteenth century (1321), and is known to have been a common claim, or reward in the Mediæval Ages to the household retainers. The first donation of a livery to the King's Clerk of the Works, yet ascertained, was in 1391. Tunics, aprons, gloves, 1355, and clogs or shoes, appear to have been the necessaries found for those of secondary and lower classes. That they were considered men of repute may be inferred from the fact that the Clergy were often associated with them in the Contracts, apparently in the place of sureties. These contracts, and the Statutes likewise, distinctly show that the Mediæval masons worked not only by the day, but that they were accustomed to take work by the piece: in one instance measured work is mentioned, 1306, and even large contracts were taken, sometimes under "heavy "penalties." They were generally bound, though not always so, not to attend at any other building; while on the other hand, the Statutes clearly show that they knew how to look after their own interests, when they did not feel disposed to submit to the "dictation" of their employers, or to be influenced by the threats of the "haughty "aristocracy" of the period. It would have been some satisfaction to have found a return of a "Register General" of the day, for I regret to say that the average period during which each master mason held his office at York Cathedral was only twelve years. Shall we speculate whether this shortness of time arose from his discharge consequent on slack work? or from being an elderly man before his merits were discovered and office was bestowed? or from dying early through injuries natural to his pursuits? Some of the agreements with them would tend to lead us to form the latter opinion as the most probable one.

These remarks may now be closed by observing that nothing has been met, in the long course of reading required for these Papers, to connect the chartered Gilds of Masons and Freemasons, noticed in the Statutes of 1360 and of 1425, and the "artificers, "handicraftsmen, and labourers" of 1548, with the Companies or Lodges of Freemasons mentioned by Ashmole in 1646 and 1682;[178] by Dr. Plot in 1686; a general assembly held, somewhere, in 1663; the one into which Sir Christopher Wren was [*not*] elected in 1691; or the four Lodges which formed the Grand Lodge at the commencement of the last century, since which period the Society of "Free and Accepted Masons" has attained its position and development.[179] The fluctuations of population and of commerce led to the existence of new towns and the decay of some of the old ones, thus, no doubt,

[178] See Gould, *History*, iii, 115, 140.—W. P.

[179] All these with many other statements have been so thoroughly investigated in an exhaustive manner, by Mr. Gould, in vol. iii. of his *History* before mentioned, that I need only refer to that work. The result mainly is that Sir C. Wren was never admitted into the fraternity; he has also established the point that the "Company of Masons" and the "Society of Freemasons" were in existence co-temporarily in 1682; this had often been doubted.—W. P.

tending to break up, if not actually breaking up, the ancient gilds or trade and mechanical fraternities; and allowance has to be made for the very great numbers of foreign workmen who settled in this country before and during the sixteenth and early part of the seventeenth centuries, bringing with them the trade traditions and usages of the French, German, Flemish, and Dutch artizans, who, perhaps, joining some of the societies or lodges they found existing in England, have probably formed the foundation for these meetings. Fortunately all this is beyond the period included in this Paper, and therefore enough may now have been said on the subject of these later times. Should I have again interfered with what may possibly be prejudices in the minds of some of my readers, I may at least,—without the presumption of thinking that all my views have been established,—be credited with having cleared the way for any future investigator into one or more of the various points.[180]

WYATT PAPWORTH.

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[180] The original authorities for the Master Masons, and for many of the other statements contained herein, will be found in *The Dictionary*, issued by the Architectural Publication Society, principally under the name of the officer in the biographical portion. Reference can also be made to the articles, Architect, Clerk of the Works, Copy, Devizor, Director, Drawing, Freemason, Imitation, Ingeniator, Keeper of the Fabric, Keeper of the Works, Lodge, Mark-Mason, Master Mason, Master of the Works, Model, Overseer, Plan, Superintendent, Supervisor, Surveyor, and perhaps Workman, &c.—W. P.

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XXXIX.

ARCHITECTURAL DRAWING IN THE MIDDLE AGES.[181]

By the late William Burges, A.R.A., *Fellow*.

FEW drawings have come down to us from the Middle Ages, but, thanks to the labours of the French and German antiquaries, we have a very fair catalogue of drawings of all ages, besides published facsimiles of a tolerable proportion of them. In *The Dictionary of Architecture* of the Architectural Publication Society, under the word "Drawing," will be found an enumeration of the more famous of these [see Addendum, page 245], to which might be added the numerous designs and drawings scattered up and down in the collection of manuscripts and prints of the various museums in Europe [see Addendum B at page 245]. Instead of going through the whole list given in *The Dictionary*, the majority of the drawings mentioned in which I have not seen,—which I should have to describe second-hand from books, or else to confine myself to noticing the fact of their existence,—I propose to treat of mediæval drawings, some facsimiles of which are published in books within every one's reach, and upon others which I have examined.

The series opens with the plan of the Monastery of St. Gall, now preserved in the library of that establishment, and first published by Keller, at Zurich, in 1844. The plan, which is drawn in thin red lines upon a large sheet of parchment, with inscriptions all over it, showing the uses of the different parts of the building, was sent, as one of the said inscriptions informs us, for the use of the Abbot Gospertus (who began to rebuild the church and monastery in 829), by some anonymous friend, who is supposed, with some reason, to have been Eginhard, the son-in-law of Charlemagne, and who held the office of prefect of the royal buildings [Illustn. xliv.]. However this may be, the plan presents us with a very complete monastery, with its great church and accompanying buildings. The red line not only seems to mark the external and party walls, but also to indicate the furniture, such as benches, tables, stoves, &c., requisite to each building. The plan is not done to scale, but certain figured admeasurements enable us to form

[181] This Paper, now edited by Mr. Wyatt Papworth, has been reduced from that on "Architectural "Drawing" read by the late Mr. Burges on the 19th November 1860, and printed in the Transactions, 1860-61, pp. 15-28. The original illustrations have been redrawn, and supplemented with others.

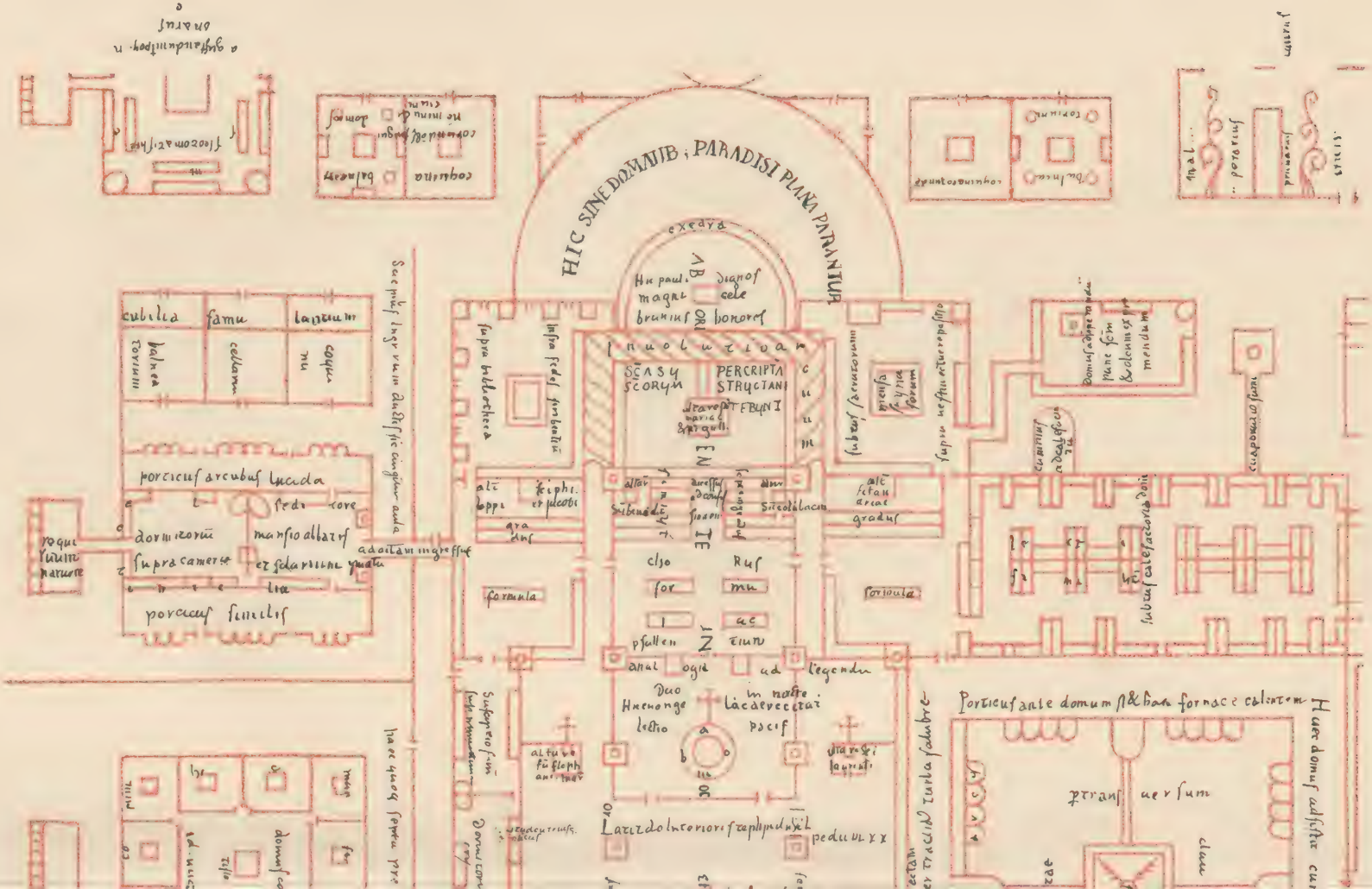
some idea of the sizes of the various parts. The church would appear to have been a most noble building, with two apses and their "paradises" or semi-circular walks. The western one was further enriched with two circular towers.

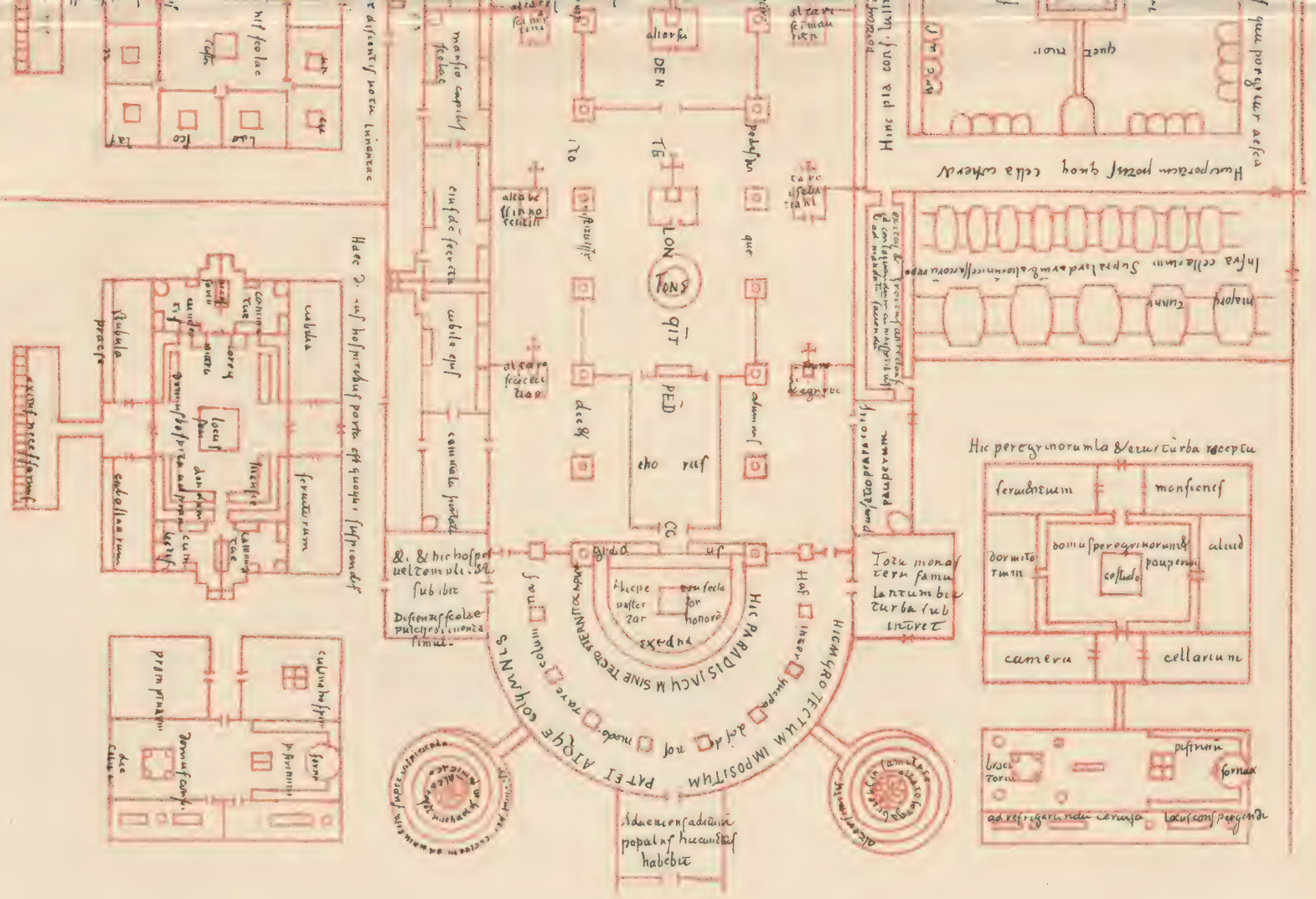
The winding stairs of these latter are shown as gradually winding round from the circumference to the centre, like a section of a snail's shell. It is doubtful whether a common winding staircase is thus represented, or whether it was really an inclined plane which went from the circumference to the centre, and so on to an upper chamber, where there was an altar, in one case dedicated to St. Michael, and the other to St. Gabriel. The ornamental finial at the top is shown on the plan as finishing the newel.

The arches of the cloisters and the crosses of the altars are shown by elevations in their respective places on the plans,—a mode which still obtains in Turkey at the present day among the distinguished native architects who have the honour of working for his Imperial Majesty the Sultan—so little have things changed in the East. Another peculiarity in the St. Gall plan is, that sundry squares are drawn in the middle of court-yards and of buildings. These, as Professor Willis suggests, may be either indications of the Classic atrium with its uncovered impluvium, or a sort of upper lantern rising above the roof, and giving light by means of clerestorey windows; both these explanations are very feasible, and both probably were intended in the original. Lastly, Eginhard, or whoever was the architect, wrote certain explanations in Latin verses on various parts of the drawing.

The next drawings to be noticed are those incidental pieces of architecture which occur in the Anglo-Saxon MSS., in which the British Museum is so rich. It is true that they are generally ill-drawn; but still they show enough to enable us to arrive at valuable conclusions as to what Anglo-Saxon architecture really was, and to refute the generally conceived idea that both architecture and history began in England exactly in the year 1066. Mr. Wright has contributed a most interesting paper on the subject in the first volume of the "*Journal*" of the Archæological Institute. In it he shows that the triangular arches, and the baluster shafts, which are now recognized as Anglo-Saxon features, occur equally with representations of domes, carved capitals, pinnacles (not crocketed), and iron work, most of which antiquaries are generally unwilling to acknowledge as belonging to the time before the Conquest; as if the countrymen of Alfred and Edgar, both great and powerful kings, should have been unable to carve a capital or use a chisel, when they were renowned all over the world for their manuscripts, jewellery, and embroidery. We owe also to Mr. Wright the first doubt as to the date of Waltham Abbey church. Hitherto most antiquaries believed it to be of the date of Henry I.,—first of all, because it was like the architecture of that time; secondly, because the two queens of that king were great benefactors to the establishment; and thirdly (and here was the rub), because it was more ornamented than any known contemporary Norman or Saxon building.

The next document I shall bring forward is a view of the Church and Monastery of Canterbury, contained in the magnificently illuminated Psalter of Eadwin, now preserved in Trinity College, Cambridge. This very curious drawing, which is made


HIC SINE DOMNIB; PARADISI PLANA PATENTIA
exedra
cubilia
famu
lautum
porticus arcubus
dormitorium
supra camera
porcicus similis
coquina
balneum
PERCRIPTA STRUCTANI
SCASY SCORUM
Duo Hmenonge
lectio
in nocte
Porticus ante domum balneum fornace calorem
Huer domus adsistit
ptrans uersum
clave

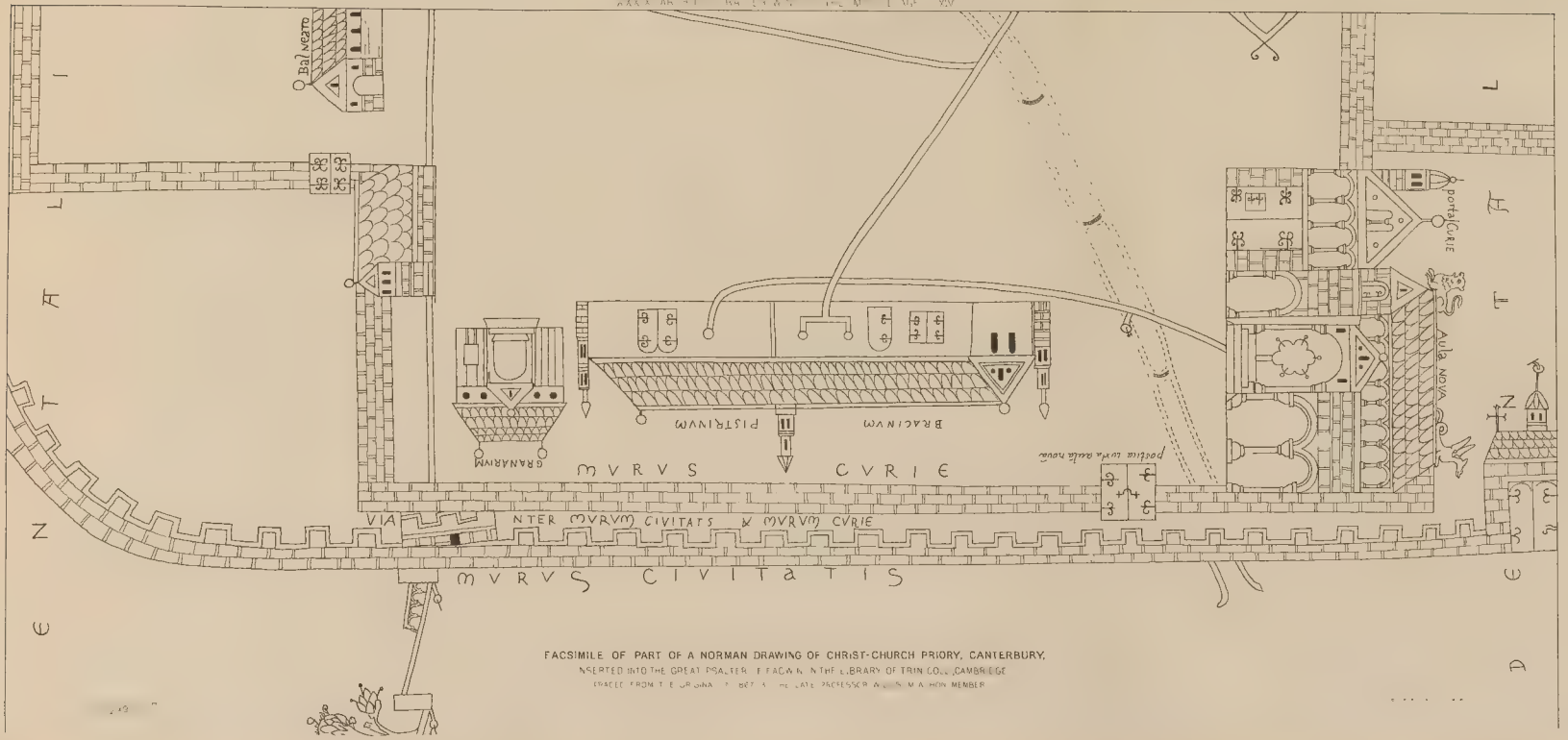


FACSIMILE OF PART OF THE PLAN OF ST GALL MONASTERY.

FROM THE JOURNAL OF THE ARCHAEOLOGICAL INSTITUTE, VOL. 5, P. 87.

[See Page 235.]

C. F. KELL PHOTO-LITHO. 8, FURNIVAL ST. HOLBORN, E.C.



FACSIMILE OF PART OF A NORMAN DRAWING OF CHRIST-CHURCH PRIORY, CANTERBURY,

INSERTED INTO THE GREAT PSALTER [illegible] FACSIMILE IN THE LIBRARY OF TRIN. COLL., CAMBRIDGE

ERASED FROM THE ORIGINAL BY THE LATE PROFESSOR [illegible] M.A. HON. MEMBER

Back of
Foldout
Not Imaged

to do duty both as plan and elevation, has likewise received the elucidation of Professor Willis, to whom I may venture to say the literature and some parts of the practice of our art owe more than to any one else. The way in which the plan and perspective are made to co-exist is by making a vanishing point in the centre of each court, so that there are three or four of these vanishing points in the drawing. The two towers which we saw in the plan of St. Gall here reappear, although in different positions. All the water-courses and drains are shown, and upon the whole, considering the very original perspective, it may be pronounced to be a very accurate drawing; indeed, Professor Willis tells us that wherever a building is shown on this plan, Romanesque work is more or less found at the present day at Canterbury. I have not been able to see the original of this drawing, but the notice in the "*Vetusta Monumenta*," where it is engraved, assures us that it is coloured.[182] As a drawing it is curious, as showing the complete development of the practice of drawing elevations upon plans, as at St. Gall. I think, however, that we must consider this drawing of Canterbury more in the light of a survey for the purpose of showing the system of water-courses than as a document to be worked from [Illustn. xlv.]. In all probability such documents would not be very common; and when the work was done the erasing knife of the writer would be brought into use, and the parchment or vellum, which was very valuable in those days, and which, by the way, is not very cheap in these, would receive a new employment.



PART OF A PALIMPSEST DESIGN, 13TH CENT.

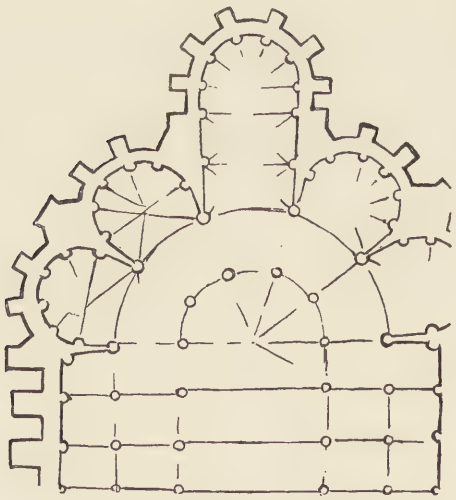
That this was the case we know from the discovery, made in 1838, of a design for the west end of a cathedral, besides several details, which were found under the writing of a manuscript containing a list of the deceased members of the chapter of the cathedral of Reims. Now the last entry is 1270, and the drawings were executed in all probability some time before. They have, according to M. Didron's account of them in the fifth volume of the "*Annales*," been first sponged out and then scraped over, to obliterate the lines, and finally cut into leaves. However, enough remained to enable M. Didron, assisted by M. Lassus, to produce engravings of several portions, which will be found equally in the same volume of

[182] *Vetusta Monumenta*, vol. ii.; the original is in the Library of Trinity College, Cambridge. It was reproduced for the Paper by Walcott, *On the Conventual Arrangement of Canterbury*, in the TRANSACTIONS, 1862-63, pp. 58, 59.—W. P.

the "*Annales.*" M. Didron assures me that the lines are very thin, which is not to be wondered at, considering the treatment they have undergone [see diagram on p. 237].

The principal composition shows a façade for the west end of a church, with the usual three *portails*, and the somewhat unusual feature of a large window above. It is either an unfinished production, or one for the use of the architect and his workpeople alone, for as little as possible is drawn. Thus, only two or three crockets are shown at one side of each of the great pediments; no ornament or figure is shown in the voussoir; the left-hand corner is, indeed, more worked up, but the artist has made up for it by showing nothing at all on the right. The whole composition appears to me to want somewhat of severity, and I hope it was sponged out, and never executed on this account. Another plate shows part of what M. Didron thinks is another *portail*, but which might possibly represent the return angle of the former drawing. It is remarkable, if really a *portail*, for showing the outer plane of the centre door as filled with tracery; if this be really the case, it gives us an arrangement somewhat similar to what obtained in the west front of the now destroyed church of St. Nicaise, at Reims. M. Didron thinks that the architect, being hard up for room, drew in the tracery of the window, but to a different scale to what the *portail* arch was drawn; but if even that were the case, a window would hardly have its centre light twice as broad as its side ones, which this has. Below this *portail* are three pieces of ornament, each drawn in between borders, composed of six lines each. What these six lines mean I am totally unable to decide, unless they represent, in a sort of shading, the rounded edges of the boutells on either side of the great hollow in which they are placed.

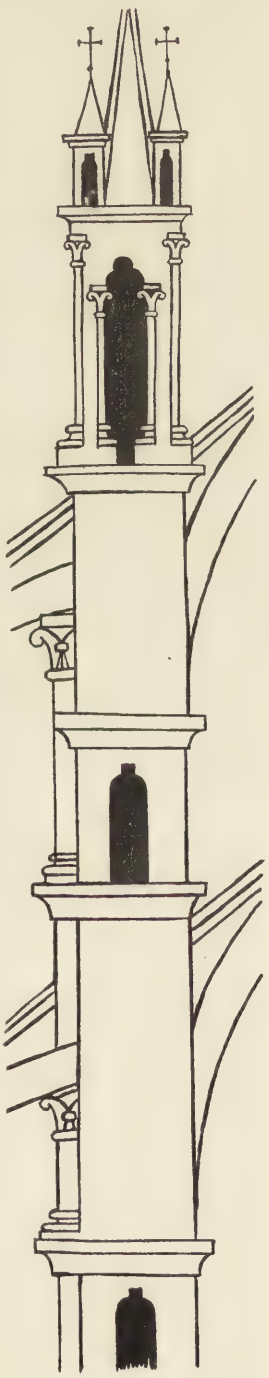
Wilars de Honecort,[183] the facsimiles of whose Sketch-book are in the hands of everybody, is the next on the list [see diagrams on this and next page]. So much has been said and written concerning these drawings that I shall curtail my description, which would otherwise have been long, considering that these are the most perfect and the largest collection of the drawings of the Middle Ages which have come down to us; and first of all I must claim Wilars for our profession, as some attempts have been made to hand him over to the sculptors and painters, because, forsooth, he drew the figure too well and frequently. There is one fact, however, which completely, so far as I see, upsets this theory, and it is this—the tendency of an artist, either painter, sculptor, or architect, would be to sketch details which would



Plan of Choir, Wilars de Honecort.

[183] Lassus, *Album de Villard de Honnecourt*, architecte du XIII^e^ siècle, &c., 64 pl., 4to, Paris, 1858; translated and edited, &c., by Rev. Robert Willis, M.A., 4to, 1859; also, H. B. Garling, *Some Remarks on the Contents of the Album of Villard de Honnecourt*, in Transactions, 1858-59, pp. 13-20.—W. P.

come in useful to him. Thus the painter and sculptor would draw parts of the human body, bits of costume, anatomy, &c.; while the architect, on the contrary, would draw mouldings, capitals, foliage, &c. Now, in the sketches under consideration we do find the capitals, foliage, and mouldings, but we do not find studies of hands, of feet, of anatomy, &c.; but, on the contrary, there are a number of problems only useful to a man engaged in actual building. The sketches were first made with a leaden or silver pencil, either of which would perfectly mark on the vellum. If the subject were an architectural one the straight lines were ruled, and the circles put in with a compass, one end of which had a leaden point. These lines were afterwards gone over with a blackish brown ink, by means of the hand alone, no instrument being employed. Upon looking again at this MS., two months ago, I was struck more than ever by the extreme precision of the touch; there is no faltering or wavering, but the line is just as thick and as firm where it ends as where it begins. Again, in drawing things in small, mouldings and foliage become simplified so as not to break up the breadth of the composition. Clearness is got by blacking hollows where they occur, and the grounds of ornament such as capitals, &c. The walls of the plans, however, are not hatched, and we shall find this practice obtaining even in the time of Thorpe, the majority of whose plans are not hatched, although not devoid of colour. One would imagine that Wilars might have hatched them up with his leaden point as he often did his drapery; but nothing of the kind occurs. Another peculiarity of our architect was, that when he copied any executed work he copied it not as he saw it, but with variations of his own, and as he would execute it himself; thus the window at Chartres is considerably altered in order to get more space for light, while that at Lausanne is so much so that it can hardly be recognised. But with all his peculiarities Wilars presents us with a decidedly good style of drawing, and which, it strikes me, might eventually be developed into something much better than that in use of late years. I mean, that we should join our improved knowledge of perspective and of the figure to the energy, simplicity, and firmness of our confrère of the *thirteenth* century.



The *fourteenth* century affords us the drawings of the Cathedral of Cologne. These I saw some ten years ago, but so far as I remember, I was told that the originals were in the architect's office, and that what I saw were copies. It is

true that they, besides several others, have been published[184] both in Germany and France, but I must confess that I should be sorry to deduce any theories as to thickness of line, &c., from the facsimiles made by the Germans, who have an abominable mode of publishing almost everything in the finest possible lines, exactly like Pugin's "*Specimens*" and other works of that period, thereby depriving them of all vigour, and producing a very false impression.

The *fifteenth* century being nearer our own time, presents us, as might have been expected, with a greater number of drawings. First, we owe to Professor Willis the explanation of the legends attached to the section of mouldings from the door of the church of St. Stephen's, Bristol, [5] made by William of Worcester in his "Itinerary," preserved at Corpus Christi College, at Cambridge; but the most interesting to us as Englishmen, are those drawings for King's College, Cambridge, now in the Cottonian collection of the British Museum. The first[186] of these shows the east and north sides of the Chapel in perspective, *i.e.*, the north side is drawn parallel to the horizon, almost in elevation, while the lines of the eastern go to a vanishing point. The drawing is partially coloured, and is especially curious, as showing a small half-timbered building at the eastern end, with a flêche containing a clock-face. The details of the architecture are very well made out, and there are ruled lines, like a modern drawing. No figures are shown in the niches, and the rain-water is carried off by regular pipes, as in the present day. Curiously enough, similar leaden pipes are to be found in those parts of the Cathedral of Beauvais erected at the end of the fifteenth century; but in this latter case they are elaborately tinned with powderings of *fleur-de-lys*, &c. Although this drawing has a look of having been subjected to a great deal of wear and tear, and of having really been used by workmen, I am afraid that its general appearance is rather of the sixteenth than of the fifteenth century. Another drawing[186] shows us the tower intended to have been erected close to the same building. As an architectural composition it is of no great value, having several stages with a small window in each, and an octagonal buttress at each angle, which buttresses finish in spirelets. The drawing is executed in ruled black lines, and has a wash of blue colour, more or less deep, all over the building. The hollows of the mouldings are not blacked in, but hatched. This drawing, which is of the tower of King's College, is in perspective, although of a very unsatisfactory kind, for, among other things, the whole of the four spires find themselves at the same level at the top of the drawing. Another design,[187] of about the same period, is that for a gallery for Henry VIII.; this, likewise, is in perspective, and runs diagonally across the page. It is drawn with the free hand in black ink or pigment, but one or two of the longest lines have been ruled. It is likewise shaded up in black, and locally coloured with thin washes, like those in Albert Dürer's works. It is a very careless

[184] The towers were published by Moller, *Fac-simile der original Zeichnung*, fol., Darmstadt, 1818, and 1837. Moller, *Denkmaler*, has engraved other drawings. The tower for S. Stephen's at Vienna, is engraved in the Allgemeine Bauzeitung, fol., 1844, pl. 528, seven sheets.—W. P.

[185] Published in his *Architectural Nomenclature*, in the Transactions of the Cambridge Architectural Society, 4to, Cambridge, 1844.—W. P.

[186] Cott. Aug. 1, vol. i. 2.

[187] Cott. Aug. 1, vol. i. 4.

drawing, and the style is a sort of bad Germanized Renaissance, with baluster columns, &c. A later drawing [188] is contained in the same collection, the date of which would probably bring us to Edward VI. or Mary. It is the façade of a house, almost in what is now called the Italian style, but with Renaissance details. The perspective is very fair, the vanishing point being in the middle of the building, so as to show the projecting wings and the external staircases in perspective. The composition, also, is by no means deficient in picturesqueness; but we can hardly praise the colouring, which, with partial shading in black or grey, presents us with a bright body-colour cobalt roof and bright vermilion casements to the windows. Before leaving the MS. Room of the British Museum I must notice one or two drawings there deposited. The first [189] is a design in perspective for a large and complicated tent. The plan may be described as like that of Canterbury and other cathedrals, viz.,—a cross with two transverses. The drawing is made in black lines, is tinted up with brown, and the ornaments are touched with yellow. The book known as Cotton, Aug. 3, presents us with several other tents, and a Renaissance fountain, the latter also in perspective, and tinted up with black or grey. It is valuable to the artist as presenting him with several very large coloured figures of the costume of the time of Henry VIII.



Design for intended Tomb of Henry VI.

The third drawing [190] is a design for the tomb of Henry VI., which Henry VII., who revered him as a saint, had, it appears, intentions of erecting at Windsor [see diagram]. The execution, however, does not appear to have come off. The design is in bad perspective, as usual, but drawn very carefully, and probably with a ruling pen. The circles and arches also appear to have been done with a bow pen. The ink is a sort of dark sepia; it is also shaded very neatly and carefully with the same. There are no

[188] Cott. Aug. 1, vol. i. 5. [189] Cott. Aug. 1, vol. ii., 76. [190] Cott. Aug. 2, vol. i.

figures shown in the niches, and the line of impenetration above is distinctly shown, whereas in some of the German drawings, if we may believe the engravings, the mouldings in similar cases are simply drawn as ending in nothing.

The Society of Antiquaries have also published in the fourth volume of the *Vetusta Monumenta*, the drawing representing the funeral of Abbot Islip. This very curious roll of vellum, which is preserved in the Herald's College, is of great value both to the antiquary and to the architect, as it presents us with sundry views of the interior of Westminster Abbey before the Reformation. The lines are thin and the execution is delicate. From it we learn what statues adorned the altar-screen, and what statues were placed above it. The dossel, eminently the most curious part, is represented as being covered up; but the brackets on the pediment of the wonderful tomb (1324) of Aymer de Valence are shown to have supported angels. Again, the blank wall space in the chapel over Islip's Chantry, where now the wax work is deposited, had a large picture of the "Crucifixion;" and another part of the roll presents us with the screens, now destroyed, which divided the chapels of the north transept from one another. Nothing can be much better than the drawing both of the architecture and of the figures in that roll. I may mention as another proof of the value of documentary evidence relating to the same building, that the manuscript life of St. Edward, written in the thirteenth century, shows what figures were placed on the twisted columns at the western end of the Confessor's tomb. It appears that they supported statues, and if we may believe the MS., coloured or enamelled statues of the king and St. John.

Drawings by J. Thorpe are preserved in Sir John Soane's Museum. As several of these drawings are already known by the tracings [now in the South Kensington Museum] made by Richardson for his *Architectural Remains of the Reigns of Elizabeth and James I.*, fol., 1840, it will not be necessary to enter into the subjects represented, and I shall only say a word or two upon the execution. Thorpe appears to have had all the advantages which we have in the present day, except that he could not rub out his pencil or leaden point. The centre lines are therefore done with a blunt point. His plans are seldom hatched, although there are one or two so treated; among them, a very curious plan of Henry VII.'s chapel, showing all the screens perfect, as well as the site of Edward VI.'s tomb in front of that of Henry VII., which tomb was put up by one of his sisters and destroyed by the other. I did not observe any cast shadows in the tinted elevations of Thorpe,[191] or of any of those which I have been noticing. With Thorpe we take leave of the Middle Ages, and I here propose to close this notice, merely calling attention to the volume of valuable and clever drawings in our Library, containing a large number of sketches washed in sepia and Indian ink, apparently designs for scenes. Although belonging to the most Rococo period, they display a power of invention and design which would do honour to any age; and we can only regret that such good men should have fallen on evil times.

WILLIAM BURGES.

[191] When I say cast shadows I mean cast shadows sharply defined. There is often a cast shadow but it is almost always shaded off.—W. B.

[Remarks on Mr. Burges's Paper by the late Sir M. Digby Wyatt, F.S.A., *Fellow.*]

With regard to the thickness of line which Mr. Burges appeared to consider a great desideratum, Mr. Digby Wyatt was not prepared to give to such a practice any unqualified adhesion. So far as Mediæval usage went, it would appear that the practice of drawing in a thin line originated with the Anglo-Saxon "illuminators," who, being unable to handle the brush as the ancients did, imitated in thin pen lines the body-colour work of the classic illuminations. This they appeared to have done by sketching on the vellum with a leaden point, and then inking over their sketches. In the celebrated Harleian Psalter the exact practice might be recognized, as in some instances the lead lines were left un-inked. When Saxon illuminations were afterwards imitated in France, the thin pen line was introduced into that country. During the eleventh and twelfth centuries the ink lines were thickened on their inner edges so as to give sharp bounding forms, and to heighten expression without reference to light or shade, much as would be now done by a person making a drawing for stained glass. That remained the prominent characteristic during the first half of the thirteenth century, when it became merged in a more brilliantly-painted style, one in which the brush superseded the pen. In the Italian drawings of Giotto, Massaccio, and others, in many of which architecture was freely introduced, the leaden point was generally used, and fineness rather than vigour of outline was aimed at. In the School of Padua outline was profoundly studied, and the cartoon of Mantegna's at Hampton Court proved his masterly hand. Bramante's style was pretty rather than brilliant, though he executed some paintings on a larger scale; Leonardo da Vinci had left many most beautiful specimens, more or less architectural, and he excelled both in the firm line and bold touch with the strong reed pen, and in the extremely-refined style with the "pennellino" as well as with the leaden and silver points. Nor for varied excellence in architectural drawing should such men as Raffaello, Giulio Romano, Baldassare Peruzzi, and Giovanni da Udine, be omitted in any dissertation on the subject. The practice of the great masters of Italian architecture was well shown by the competition drawings still preserved in the Sacristy of San Petronio, at Bologna. As British architects they could congratulate themselves on that remarkable English artist, Inigo Jones, who was a great master of the pencil. His excellence as a draughtsman in landscape and figures was shown in his Sketch books (more particularly in his studies for the scenery and costume of masks and pageants), and his architectural drawings were admirable.[192] Wren was a good and careful draughtsman, but not artistic. Kent, though an indifferent designer, drew with a most brilliant touch, almost rivalling that of Berain, the "dessinateur des menus plaisirs, &c." to Louis XIV. The brothers Adam were remarkable for their ability, and their drawings were exceedingly spirited. After the improvements of Uccello and the age of Bramante, it was the common practice to draw architectural subjects in perspective, and the perspective was far better

[192] An octavo sketch book with the date "Roma, 1614," is in the possession of the Duke of Devonshire, who published it in facsimile, cir. 1832; the contents are described in the *Archæologia*, vol. xxiv, 354. The Duke also possesses many original drawings by Jones and later architects.—W. P.

than it generally had been before their time. In several of (Bramante's son-in-law) Raffaello's pictures and sketches, the architectural perspective is studied with the greatest care. Many of the XVth century illuminators, especially the Flemish, drew architectural subjects in very fair perspective. This was apparent in the works of the Van Eycks, and more especially in those in which their sister, Margaret Van Eyck, was supposed to have participated. He had seen some unfinished pictures by Van Eyck, which showed that the outline was first drawn in pencil in the finest possible outline, and the shadow given from the brush with the greatest delicacy. Nothing could be more pure in style than these drawings.[193]

[Extract from the article "Drawing" in *The Dictionary of Architecture.*]

It appears difficult to understand how a foundation could be put in, of proper proportions, before the nature of the superstructure had been determined. Yet Raine, *Catterick Church*, 4to, 1834, p. 13, says: "No reference is made in the contract to anything resembling the working drawing of modern times; "nor has the greatest pains, taken for this purpose, been able to discover any such record relative to any "other early fabric. The archives of Durham Cathedral have been carefully searched for architectural "plans, but without success. A manuscript commentary upon the prophet Ezekiel, belonging to the "Dean and Chapter of Durham, written apparently in the eleventh century, contains some curious pen "and ink delineations in the Norman style, of Ezekiel's temple, such as ground-plans, elevations, etc., "which prove the architectural skill of the commentator, and the fact that it was no unusual thing to "commit to parchment illustrations of this nature. 'Patternes in paper,' 'portraictures,' 'patternes in "timber,' are referred to in the contract for the Beauchamp Chapel at Warwick in 1439; but during the "earlier centuries of our national architecture, we suspect that models in wood, or drawings upon "wooden tablets were in general adopted as specifications, by the contracting parties, and referred to "during the progress of the work." The value of parchment seems to have been sufficient to cause the erasure of designs upon that material, so that it is hardly reasonable to expect the discovery of any drawings made before the general use of paper, unless the original owners and their heirs had considered that the preservation of such documents would be useful. Such a feeling does not appear to have existed in England: Britton, *Dictionary*, s. v. Cathedral, also observes, "it is a remarkable circumstance, that "amongst the numerous records preserved in muniment rooms respecting cathedrals, there have not been "found any ancient drawings of the ground plans and architectural designs for these splendid national "buildings." If exception be made in favour of the valuable section of the mouldings to a door of the church of St. Stephen, at Bristol, engraved in facsimile by Willis, *Architectural Nomenclature*, 4to, 1846, from the original in William of Worcester's (or Botoner's) *Itinerary*, preserved in the library of Corpus Christi College at Cambridge, there does not seem to be as yet any knowledge of architectural drawings in England older than those in the British Museum, Cottonian MSS., Augustus I., II., and III. Among these is "The monument intended for King Henry the Sixte," beautifully (for the time) drawn and slightly shaded in ink, on parchment 24 ins. by 15 ins., which has been inadequately engraved on a reduced scale in Gough, *Sepulchral Monuments*, fol. 1796, ii. 231. Another is entitled "Capella bte "Marie in collegio regali Cantabrigie," and is a slightly tinted view of the exterior of King's College Chapel while the interior was being finished; it is on paper, and is 48 ins. long by 26 ins. wide. This is accompanied by a less excellent drawing, 52 ins. long by 15 ins. wide, being the design for a "Campanile regalis Collegii Cantabrigiæ," which has been engraved on a reduced scale, with many alterations in the drawing, in Lysons, *Magna Britannia*, Cambridgeshire, 4to, 1808, p. 116. A tinted drawing of a gallery intended to be built for Henry VIII. may be passed over; but three large drawings, highly coloured, with the decorations in gold, of magnificent pavilions made of tents, deserve

[193] These "Remarks" were made by the late Sir M. Digby Wyatt in 1860, during the discussion of the original Paper read by the late Mr. Burges; and Sir Digby's opinions, which he may have ultimately modified, on the subject of early architectural drawings, are here re-printed as they were delivered, though in a condensed form.

much attention. The Society of Antiquaries, *Vetusta Monumenta*, fol. 1808, iv, pl. 16-20, has published the pictures of the death (1532) etc. of John Islip, abbot of Westminster, which contain his hearse, chapel, and other details. Many of the contracts which have been recovered refer to then existing works as *models for imitation*.—W. P.

ADDENDUM A.

To the above extract may now be added a few other references:—A book of Geoffrey of Monmouth, XIV cent., in the British Museum, Royal MS. xiii A 3. contains marginal sketches of various towns, buildings, details, &c. ; some are engraved in the *Building News*, 4 Sept. 1868, p. 596. A drawing on vellum, 1421, of the old steeple pulled down 26th May (first stone of the new steeple was laid 25th Sept. 1421, and completed 1430) is in the possession of the Parish of S. Michael, Cornhill ; it is copied in Wilkinson, *Londina Illustrata*, 4to, 1819. A fac-simile of a drawing by Robert Pyte, an English artist temp. Henry VIII, on parchment, 18 inches by 27½ inches, is given by Richardson, *Observations on Elizabethan Architecture*, 8vo, 1837; and some other plates. A drawing by Lord Burghley, 1578, of part of the plan of Havering Palace, Essex, is in the British Museum, Lansdown Collect. ; a reduced copy of it is given in Ogborne, *Essex*, 4to, 1814, p. 112-3. In "The King's Collection" in the same institution is a drawing on parchment of a plan entitled "Modell of Stansted Hall (Mountfichet, co. Essex) as it is "partly built and as the rest was intended by Mr. Thos. Middleton about the year 1658."

ADDENDUM B.

The following Papers have been published in the TRANSACTIONS :—

G. Gutch, *Some Account of the original Drawings and Designs by Inigo Jones, Sir C. Wren, and James Gibbs, preserved at Oxford, with catalogues* 11 April 1836

A. Poynter and T. L. Donaldson, *Report on Drawings by Palladio, at Chiswick* 17 Nov. 1845

T. L. Donaldson, *Description of Original Drawings presented by the late Chevalier Wicar, in the Lille Museum* 14 Nov. 1853

A. Ashpitel, *Italian Architectural Drawings in the Royal Library at Windsor* 16 June 1862

T. L. Donaldson, *Description of the Working Drawings of the New Opera House in Paris* 4 April 1864

T. L. Donaldson, *On Autograph Drawings of the Great Masters of Architecture* 28 Feb. 1870

T. L. Donaldson, *On Autograph Drawings of the Great Masters in Architecture, preserved in Public Libraries in Italy* 8 Jan. 1872

C. P. Clarke and T. H. Lewis, *Persian Architecture and Construction* 31 Jan. 1881

Also may be mentioned :—

W. Longman, *History of the three Cathedrals dedicated to S. Paul in London* 8vo. 1873
Gives the design by Sir C. Wren as sanctioned by the King, and other drawings for that edifice.

H. de Geymüller, *Les Projets primitifs pour la Basilique de S. Pierre de Rome* fol. Paris, 1875-80

H. de Geymüller, *Raf. Sanzio come Architetto* fol. Milan, 1884

H. de Geymüller, *Les Du Cerceau, leur Vie et leur Œuvre* 4to. Paris, 1887

The "*Album de Villard de Honnecourt*, XIII^{e} *siècle*," as mentioned in note 183.

The Sketch Book of John Thorpe, temp. Elizabeth, as referred to on page 242.

The Original Drawings for Whitehall Palace made for Inigo Jones are in existence, or copies of them.

In Sir John Soane's Museum are many collections of drawings by the Brothers Adam, by G. Dance, and many later architects.

WYATT PAPWORTH.

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